The Builder.

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Edinburgh City Improvements.

BY the Edinburgh Improvement Act, 1867, certain trustees were appointed, who were authorised to impose a tax not exceeding 4d. in the pound for a period of twenty years, and to borrow on the security of the assessment a total sum of 350,000*l.* At the 1st of August, 1877, the total expenditure was 442,621*l.* 18s. 6d.; receipts, 265,599*l.* 18s. 5d.; unrecovered outlay, 177,022*l.* 0s. 3d.; amount at credit of Sinking Fund account, 6,752*l.* 14s. 10d.

Now that the labours of the Trust are drawing to a close, we take the opportunity of reviewing the scheme of improvement, and the manner in which it has been carried out. But it will be desirable at the outset to take a glance at the physical and artificial features of the scene of operations.

The original city of Edinburgh occupied a ridge of ground of about a mile in length, having at its highest or western point, the rock upon which stands the castle, and at its eastern or lowest extremity the Palace of Holyrood. This ridge is bounded on the north by a valley formerly filled with water, and called the Nor Loch, but which is now converted into public gardens through the centre of which runs the North British Railway. The valley to the south is occupied by a narrow street, running along its whole length, called the Cowgate. This old town was fortified and encompassed by a wall, a necessary precaution against the frequent incursions from beyond the Border.

The main street from the castle to the palace is broad and spacious, and the houses on either hand are unusually high. Many of these tenements formed the residences of the ancient nobility and gentry of Scotland, and behind them were gardens running down the slopes to the valleys on either side. As the population increased, the house accommodation within the walls became insufficient, and as the existing tenements had reached the maximum of height, the gardens behind were resorted to as building sites. The practice adopted generally was to form an arch right through the ground-floor, and upon either side of the garden ground to erect lines of new buildings having a narrow passage or close between. So narrow were some of these closes that conversation could be easily carried on between opposite neighbours, and into the recesses of some of them the sun could not penetrate.

When quieter times ensued, and the citizens ventured to build outside the walls, the old town was gradually deserted by the upper classes, and the dwellings were let to an inferior class of tenants. To meet the requirements of the new tenants, the old houses were divided and subdivided, and it became no uncommon thing for a family in the lowest state of destitution to be the occupants of a room enriched with a panelled ceiling, and a mantel-piece exhibiting the relics of heraldic devices. The sanitary condition produced by the crowding of numerous families into closely-compacted houses unprovided with the necessary appliances can be readily conceived, and to mitigate this evil was the principal object of the formation of the Trust, and at the same time to open up new lines of communication.

The improvements were not only intended to be such in a sanitary and utilitarian point of view, but were also to be so in an æsthetic sense; and the more effectually to carry out that purpose, the late Mr. David Cousin and Mr. John Lessels were appointed joint architects to the Trust.

The first scene of operations was upon one of the most wretched slums in the city, St. Mary's-wynd, the Rag Fair of Edinburgh. It was a very narrow and stifling ally, to navigate the intricacies of which required some amount of courage. You could not help coming in contact with cast-off apparel of all kinds, you were apt to knock down a pile of old boots, to stumble over a dilapidated armchair, or to overthrow a pyramid of pots and pans. If decently attired, you were looked upon as an unwelcome intruder or importuned to purchase an example of the old masters (?). St. Mary's-wynd is a thing of the past, and St. Mary's-street is a spacious thoroughfare, presenting on one side at least a handsome façade in the Scottish domestic style, which displays a picturesque variety of outline and detail. The west side of the street, with the exception of its southern angle, has been left in its original state, in the expectation that in course of time it will be treated by the proprietors in a similar manner to the other.

A short distance to the west of this was Blackfriars-wynd, which has been treated in the same manner as St. Mary's-wynd, but in this instance the result is not so satisfactory, owing to a difference between the levels of the footways on either side. The footway on the west side is so much below the level of the street as to necessitate its being fenced off from the roadway by an open railing. The street has thus a decided look of incompleteness, and the buildings preserved are of the poorest description, and seem as if ashamed to face the light of day. It would have been better for all concerned had they been entirely cleared off, but the authorities were actuated by economical motives, and looked to the probability of this being done by private enterprise; but there are so many conflicting interests that combined action is difficult, a single tenement belonging generally to several proprietors. Behind these old houses an extensive area has been cleared, between Cant's and Dickson's closes, thus opening them on both sides, and greatly enhancing the value of the sites. Altogether it seems to have been a short-sighted policy which left one side of a street in its original state, and always has been found so.

St. Mary's-street is in a direct line with the Pleasance, which, with its continuations, runs due southwards till it meets the open country. To render this thoroughfare more completely available, it was deemed necessary to continue it in a north-westerly direction to the Waverley Station. This has been done by forming a roadway which takes a semicircular sweep from the head of the Canongate, behind John Knox's Church, onwards to the south end of the North Bridge. The south end, and the whole of the west side of Leith-wynd, have disappeared in these operations, and the north ends of several closes have been opened up. One large tenement, designated the "Happy Land," the haunt of the most abandoned characters, has disappeared, amongst the rest, and upon its site now stands one of the fine schools erected for the School Board, *sic itur ad astra*. The fall of the ground from the Canongate to the lower level at the north-west is about 27 ft.; and as the ground slopes rapidly to the north, it was necessary to form a viaduct, the arches of which have been left free towards the railway, to be made available for storage, and the south side only is to be built upon. The new street has been called Jeffrey-street, and is still incomplete; at its upper or southern end it has been occupied by shops and tenements designed by the architects of the Trust. About half-way down the decline stands the new Trinity College Church, designed by Mr. Lessels, and beside it is a large and picturesquely-treated warehouse, from the designs of the late Mr. John Paterson, architect. Other sites have been taken, one of them for a new Episcopal church, which has been entrusted to Mr. Robert Anderson, architect.

The next scene of the operations of the Trust was a confused and confined mass of buildings to the north of the University. The clearing away of these left a large and valuable area available, and this it was resolved should be set apart for a superior class of buildings to those hitherto contemplated. A feuing plan was accordingly prepared by Mr. Cousin, showing a thoroughfare 80 ft. in width, and elevations of a highly ornate Renaissance character. The new street was designated Chambers-street, in compliment to the then chief magistrate of the city,

to whose exertions the carrying out of the scheme is mainly owing. The south side of the street is almost entirely occupied by the lengthy side, façades of the University and the front of the Museum of Science and Art, but a short space at its western extremity is still occupied by some unsightly tenements, which, through a shortsighted idea of economy, were not acquired, and they are now worth three or four times what they might have been got for at first. The new line of buildings is divided by openings into four blocks, and each of these Mr. Cousin has treated in a different manner. The ground-floors of the two easternmost blocks are appropriated to shops, but in the other two blocks no provision is made for such. All the sites, with one exception, have been appropriated, but unfortunately the requirements of the parties who acquired them have not, in every case, been compatible with the elevations prepared. The first deviation from the plans was occasioned by the acquisition of one of the sites for a church, and as the plans for it were not entrusted to the architects of the Trust, there was some disparity of sentiment displayed as to the style of the sacred edifice. It has been erected as designed, and was fully described in these pages. The second deviation from the original plans was on account of a Normal School which is now in progress; it is designed by Mr. David Rhind, and occupies the westernmost angle of the second block, counting from the east. Whilst Mr. Rhind has adhered to the elements of the style adopted by Mr. Cousin, he has deviated therefrom in giving greater height to his elevations, and by breaking up the skyline by Mansard roofs; this is not done in the rest of the block, which shows a line of dormer windows. Between the two westernmost blocks there is a vacant space which abuts upon the works of a brewery, and, as a sufficient depth for building sites at this point could not be secured unless at a great outlay, the buildings behind are to be screened off by an ornamental wall, leaving a semicircular recess towards the street, which will form an appropriate site for a public monument or fountain.

Proceeding further to the south, we find that a new thoroughfare has been opened up between Nicholson-street and Bristo-street. This has been done by the removal of very little property, as the line of the new street (named Marshall-street) embraces two squares, Nicholson-square and Alison-square. The short space between the latter and Bristo-street is now occupied on one side by a handsome Board school, and on the other by two blocks of dwelling-houses and a Baptist chapel of strongly-pronounced Lombardo-Venetian character. This chapel was fully described by us at the date of its completion. A great improvement has been effected here upon the unsightly garden which occupied the centre of Nicholson-square; it has been slightly curtailed to provide for the flow of traffic, the dilapidated railing has been replaced by a new and more substantial one, and the ground laid out in a suitable manner.

A similar improvement to that of Marshall-street has been effected by demolishing a tenement between Davie-street and Simon-square, and opening up Gibb's-entry onwards to the Pleasance. The only new erection on this line is a large warehouse, designed by Messrs. Thornton, Shiells, & Thompson, which displays an effective arrangement of crow-stepped gables and dormers.

The last scene of operations to which we will refer is the Grassmarket, the south-east entrance to which has been considerably widened. This necessitated the removal of a number of very picturesque tenements, which were, however, in the last stage of decay, and the new buildings substituted for them are carried out in the old style, and every way suitable to the locality.

Such are the principal objects embraced in the scheme; but, besides these, open spaces have been cleared in densely-crowded localities, so that sun and air may penetrate, but these clearances are mostly in the rear and out of view of the general public.

The trustees cannot justly be accused of extravagance, but it might be hinted that they have not gone far enough, and have left undone some things that are desirable, and of which the longer they are delayed the greater will be the cost. But it should be kept in view that at the outset powerful opposition was offered to the entire scheme by that portion of the ratepayers who object to the imposition of any tax for whatever purpose.

TRUTH ABOUT "SHAMS."

WE printed the week before last a letter from a witty and outspoken correspondent maintaining that all that has been said or sung against the use of shams in art is but a self-delusion, or a shallow pretence on the part of those who have hoisted this anti-sham flag, "that flimsy piece of bunting," as our correspondent called it. Let us, he urged, hear no more about the iniquity of shams, seeing that to sham well or wisely is, in fact, the real object of art.

The frank utterance of such an opinion is only an instance of what we constantly see, that the over-persistent proclaiming of a special truth, or the insisting upon it as the central and chief truth when it is not so, gives rise to a reaction of opinion in favour of the opposite view,—a reaction which is apt almost unavoidably to go too far in the other direction. This is the case with our correspondent "Meter," with whom we are by no means prepared to say that all which has been urged against shams in art by a certain school of critics is mistaken and trivial, or, in fact, that there is not much truth and reality in that crusade, though the zeal of some of the combatants may have carried them too far, and landed them in conclusions which it is at times hard to reconcile with what is called "common sense."

In the first place, in considering what is the real truth, *pro* and *con.*, in the matter, there is a certain confusion of thought or expression to be cleared away, as to what sham in art really means. The view has been put forward that all art is really "shamming nature," or at least that the realistic painting, which has mostly been admired and recommended by those who have also taken up the sword against shams, is so; and that its main end and triumph would consist in imitating nature so closely as to deceive. *Apropos* of this, we may remark in passing that the assertion that Quintin Matsys has ever in this country been placed before Michelangelo or Raffaelle, either for his deceptive painting of a fly or from any other cause, must have been news to most of our readers, and that our friend "Meter" certainly overstated his case in that particular. But what we specially refer to as a confusion of thought is the idea that realistic painting in its wider sense, as the endeavour thoroughly and minutely to represent nature, has anything in common with the kind of thing which has usually been denounced as a sham, such as the endeavour to make a material resemble or mimic another superior or more costly one. The two things are radically different. In the first place, the picture can deceive no one as a whole, because it is necessarily on a smaller scale than nature, and is hung against a wall in a frame; to speak of it, therefore, as if it were an attempt to cheat the eye into the belief that it is really seeing nature through an opening or a window, is absurd. The only kind of picture in which a momentary deception is sometimes possible, and has been occasionally aimed at, is in small representations of objects of still life of the real size; and here, in a general way, it may be said that the object is mimicry; but then no one thinks of giving such works the highest place in the art of painting, or regarding them as exhibiting the chief aim and achievement of the art. When of the highest degree of ability, they acquire great value and interest as wonderful specimens of what the manipulative art of the painter can do; for *bravura* of executive power in any art is always a fascinating thing, and tends, moreover, to keep up the standard of technical ability, a thing never to be despised, as being the necessary means to the end. But the painter who executes with great care and realism a scene in nature, or a tree or collection of trees, or the tones and curves of the sea in motion, is not endeavouring to cheat our eyes into the belief that the trees or the sea are there. The mere fact that he cannot represent movement on his canvas pulls him up at once in any such attempt, if it ever entered his head. The real motive, even with some very professedly realistic painters of nature who endeavour to give all her detail exactly as they see it (and who, as before observed, are usually among those who make the most open objection to "shams"), is either a feeling that everything in the growth of nature is so interesting and beautiful that it cannot be too carefully studied and painted (if it is painted at all), or a conviction, which we know some exceptionally-gifted painters among us at present really entertain, that the poetic feeling which underlies nature, and is her metaphysical expression, is best and most truly reached by him who gets the outward semblance of her face most fully and truthfully,—a theory against which the only real objection to be urged, though it must be admitted to be a fatal one, is that, except in a very few peculiar cases, such complete imitation of the infinite multiplicity of nature is simply impossible by any finite mind and hand. But even in cases where something like this is possible, we are unable to see how any reasonable criticism can charge the painter with "shamming," except in a sense in which that word never has been used or understood in common parlance. When we come to those broader and freer schools of art which translate or transmute rather than imitate nature, it is obvious that the word is still less applicable. When the countryman stooping over M. Rousseau as he was painting a tree, said, "Why are you making the tree, when it is made already?" he asked a question altogether beside the mark, because the artist was not imitating or "making" the tree except in a very secondary and modified sense; he was interpreting it rather than copying it. So with portraiture, which might be called "shamming" with more show of reason, perhaps, than landscape painting; we, nevertheless, know well enough that the finest portraits are often those which it is least of all possible for one moment to mistake for reality. Artists like Merle and Madrazo aim at deception sometimes, at shamming reality so as almost to deceive the eye: we have seen, for instance, a head of a lady by Merle which, had it been deceptively mounted or framed in any way, it would have been very difficult to tell from a real head without shifting the position of the spectator; but the picture was, comparatively speaking, of little value, and no very critical collector would have allowed it in his gallery. It is obvious, therefore, that "sham," or anything which can be fairly called so, has little or nothing to do with painting as an intellectual art and in its highest forms. The only kind of painting which is really a "sham,"—that is, which is purposely contrived and intended to cheat the eye, is theatrical scene-painting, the objects of which, it is needless to say, are very different from those of the art of painting in the abstract.

But when we turn to the kind of processes which, by those who may be called purists in art, have been denounced as "shams," such as artificial materials, marbling, graining, veneering, and plating, we find the standard by which success is judged in regard to these achievements is radically different. They are deceptions or they are nothing. It is intended that the walnut-grained door should pass for walnut, that the ebonised cabinet should pass for ebony, that the "scag." should pass for marble, and the plated article for solid silver. It is nonsense to say otherwise. Every one who remembers the first production of electrotype, for example, must remember that the very form in which it was recommended in advertisements implied that its great advantage lay in its presenting the appearance of solid gold and silver without the reality and consequent expense. Our critical correspondent inadvertently admitted this in so many words. "The electrotype process has enabled people of moderate means to rejoice in the presence of seeming gold and silver surroundings." Exactly so; and could there be a greater or more decided "snobbery," artistically as well as socially? It might have been possible to put the case better than that; to urge that gold and silver surfaces are sought purely for the beauty of the material, for no doubt this is partly the truth in many cases. But that is not the whole aim. It is unquestionably the fact that the possession of gold and silver plate, on account of the costliness of the materials, has long been associated with a certain social position, a certain degree of wealth and prosperity; and articles made of these metals, on account of their intrinsic value, have been carefully preserved and become heirlooms from generation to generation, and have thus associated with them also a kind of hereditary and historic dignity, which (though it may be overrated) is connected with a more respectable sort of pride—family pride—than that which is based on mere wealth and prosperity. And the real and central object of plated ware, however it may be glossed over, is to sham the possession of valuable "plenishing" of this

kind. The process is done now with a completeness and verisimilitude such as to deceive the eye of most people not learned in Hall-marks. But, for all that, when we discover that a richly designed and ornamented piece of plate is not in substance what it appears to be, is not its dignity, even its beauty, immediately and hopelessly impaired in the eyes of true taste? It is, of course, perfectly true that the art-workmanship which ought to constitute in our eyes the highest value of "the cup and platter," may be nearly as well displayed (not quite) in imitation precious metals as in the real material; it is also true, as we have often urged, that it would argue a better and purer artistic taste among us if, in selecting objects for the adornment of our daily life, we were more particular as to *how* they are made (designed), than as to *what* they are made of. But then that applies to things which are honestly and ostensibly made of the less costly material, and which appeal to artistic judgment only for the pleasure to be derived from their possession. However habit may have accustomed us to overlook the fact, it is certain that the shamming of the more costly material by imitative processes is essentially a vulgarity, and would be felt to be so by all persons of good taste and really refined feeling, if all had time to think about it, and opportunity to gratify their own better judgment. In a great many cases this is not so, and people have to purchase what is set before them in the shops and make the best of it, putting their own private tastes on one side, and taking up with what the judgment of the more vulgar-minded majority has pronounced to be the correct thing. "Thou shalt have silver and gold on thy table, and if it be too costly for thy purse thou shalt sham it"; that is the verdict of modern society, and consequently, on the moment, there is nothing else to be got, for the verdict of the majority rules the manufacturers and dealers. And it may, of course, be added, that for articles that are for table use the mock-silver material is a ready means of insuring a surface which is wholesome and comparatively indestructible by contact with various condiments, which cannot be said of some of the less costly metals. But if we go out of the groove of habit and come to exercise our own unbiassed tastes, would not good taste and "common sense" any day pronounce in favour of an earthenware teapot of good design, and a horn spoon with a little mounting of real silver on it, in place of mock-silver articles of either kind?

And we believe the same feeling holds good, and is perfectly in accordance with "common sense" as well as with æsthetic taste, when we turn to the development of shams on a larger scale, which are more directly connected with architectural adornment. We very well remember the kind of disgusted feeling which found expression among a party of architectural visitors looking over old Northumberland House shortly before its demolition, when it was realised that the pompously described "marble staircase" had not a particle of marble in it; but was all "scag." from floor to ceiling. That is an extreme instance which is a good illustration of the carrying out of sham on a large scale, and in the most complete manner; and we hold that the feeling of annoyance and repulsion which such a proceeding excites in many people, as on the occasion alluded to, is a healthy and sound one, entirely in accordance with common sense. We are met every day, and at every turn, by smaller specimens of sham of the same kind; graining doors and wainscots in imitation of superior woods, &c. This has been said by its apologists to be an imitation of the beauty of nature, and to stand thus on the same level, in regard to the "sham" question, as landscape-painting, or any other imitation of nature. But whatever may be said for it, and without intending to attach too much importance to a comparatively trivial detail, imitation graining at all events cannot be defended on that ground. The highest object of landscape-painting, for example, is to reproduce in us the feeling which nature arouses; the gloom or the brightness, the pathos or the joy of nature; and mere imitation of surface-detail is not necessarily a part of the process; a comparatively rough sketch, in which there is not the faintest pretence to optical illusion, may accomplish it more fully than a finished picture which wants the poetic *afflatus*. But the grain of oak or maple or walnut is not a thing that appeals to our feelings or causes intellectual pleasure of a high order; it is simply a rather richly-marked and elaborate surface which gives a kind of complexion to what otherwise might seem a too dead and blank surface; and the imitation of it must be an imitation, an illusion, or it is nothing.

It does not stand the least on the same footing as paint, because in painting a door we frankly say, "I am not satisfied with the raw colour of the natural material, and I am putting an artificial colour, and perhaps an artificial decoration over it"; but in imitating the grain of a superior wood on a deal panel, what we really say is, "I like the grain of a fine wood, but as I cannot afford the wood, I will take a cheap wood and imitate the marking of the better wood upon it." That is the plain English of it, and without riding the high-horse and making such a thing an infringement of moral principle, we may still fairly ask, is not the feeling and taste which prompts this essentially a vulgar one? And is a man's time well employed (that is another question) in doing this laborious mechanical imitative work, which never answers its end after all? For in this respect graining stands worse than electrotyping; it never does really deceive the eye or thoroughly reproduce the marking of nature: and it may fairly be said that life is too short, and there are too many things better worth doing, to make it desirable that a man should spend the cunning of his hand and eye on work of this kind.

So far, then, we distinctly think that the condemner of shams is in the right, provided only that he does not expend too much and too solemn vaticination upon matters which, after all, are only among the less important questions which affect our life. It is, in fact, the overwrought eloquence and loftiness of moral rebuke which has been poured forth about shams by a section of enthusiasts, which has not unnaturally led some persons to suppose that "common sense" must lie in the opposite direction. But there was at one time a good deal said in condemnation of what was called sham construction, or the concealment of construction in buildings, which did amount to something very like nonsense. A typical enthusiast of the class was Pugin, who built his house with bare stone walls in the interior, denouncing plaster as a sham; and some followers of the school carried the matter so far that they would hardly admit the timbers of their open roofs to be dressed. So far as the mere fact of putting an internal covering on the rough wall, as a more comfortable finish, is concerned, we might almost as well denounce our own skin as a sham, because it conceals the muscles. The fair ground of objection to plaster would be, not that it is a sham, but that it is not the best, most durable, or most pleasant material that can be used for lining a house. A tile lining or an oak wainscot would, no doubt, look more durable, more dignified, and be cleaner and more washable; but then it becomes simply a question of economy of expenditure, sometimes of comfort.

The still larger question in regard to architectural shams, the question which in the most important manner affects architectural design, is whether it is or is not allowable, or good architecture, to put irregular plan into regular design; to make a symmetrical façade for an unsymmetrical arrangement of rooms. At one time it was propounded as a matter of architectural faith, and is still held so by some persons, that no piers and window should be spaced evenly externally unless they naturally came so from the internal division of the plan; and the same principle was to go throughout the building. If everything not built on this principle is to be condemned, there is no question that we should have to condemn nine-tenths of the buildings of the Renaissance period, many of which have been all but universally admired ever since they were built. What we should say is, that it is impossible to draw a hard-and-fast line, and that the sense or nonsense of the thing very much depends upon circumstances. When the discrepancy between exterior design and interior plan is carried beyond a certain point, as for instance in the often-cited case of Blenheim, where the kitchen exactly balances the chapel, every one feels the absurdity at once; but to say that in no circumstances is a symmetrical façade to be made unless what is behind it is in every respect equally symmetrical, seems to be removing from architecture what is really one of her functions,—that of giving a fair and stately aspect to a building which is essentially utilitarian in its objects, so far as plan is concerned. What should be aimed at is to keep the character of the exterior and interior in harmony with each other. The more important a building is in its purposes, the more it approaches being an edifice of state, the more it will tend to take symmetrical forms in plan, because in a such a building there is always room to lay out a plan without economising space by utilising odd angles. If, therefore, the general plan is formal and grandiose in its arrangement, it will fitly allow of a symmetrical architectural treatment, even if the symmetry of design do not in detail exactly coincide. For instance, if we have a row of five windows forming a symmetrical group externally, we are not called upon to break their symmetry, and the consequent stateliness of the external façade, merely to show that they are divided between one room with two windows and another room with three windows: always supposing the two rooms are of nearly equal importance or belong more or less to the same *suite*. On the other hand, to place our symmetrical group of five windows in front of a congeries of small offices, a staircase, and a lavatory snatching light out of the corner of one window, may be pronounced to be bad and "sham" architecture, showing either that the designer has got these features of his plan in the wrong place, or that he has failed to appreciate the general relation between the character of the plan and the character of the exterior, and to understand that while a stately character of plan will bear a stately exterior, a rambling and rabbit-warren plan demands an entirely different architectural treatment.

One word more as illustrating the attitude of what is called "common-sense" towards real and unquestionable architectural sham. St. Paul's Cathedral comes into every discussion of the subject; it was brought into the communication which suggested these remarks. Leaving the dome alone this time, we take the case of the flank design of the nave, with its upper order forming a screen to the Gothic construction behind it. We have several times, when passing St. Paul's in company with some acquaintance who had no connexion with art or architecture, and professed no theories whatever upon such matters, made the practical experiment of directing the attention of such companion to the screen wall, and informing him of its real function, by way of testing the effect of the information upon the average public mind. And we have in every case found that the first surprise at the discovery (for we verily believe not one person in ten thousand who pass the cathedral knows this fact about it) has been followed by an expression of disgust or derision, and that the representative of average public opinion has gone on his way thinking rather less of the metropolitan cathedral than he did before. So much for our experience of the attitude of "common sense" towards sham architecture.

WATER SUPPLY.*

IF not *the* subject, yet may water supply be correctly characterised as one of the subjects which rightly command the most anxious attention of all those concerned in the guardianship of the public health, or the housing of the people. Nor is Mr. Ansted unknown as a writer. His works on "Physical Geography," on the "Elements of Physiography," and on the "Ionian and the Channel Islands," are cited by the publishers of the present work in their list of publications. And on more than one occasion discussions have taken place at the Institution of Civil Engineers on papers drawn up by the same writer.

The announcement, therefore, that "there is a great body of information in existence, justifying an attempt to bring together for the use of practical men an outline of the facts bearing upon water supply, and calculated to suggest important matters for study and application," is one that is calculated to call attention to the book. It is the more needful to point out that the expression "bearing upon water supply" is to be taken with extreme exactitude, as being quite distinct from that which forms the real desideratum of the day,—the facts of the water supply. As to these, the book is chiefly notable as an indication of how very little practical information has as yet been collected on the subject; nor has the reader been helped by proper reference to the best authorities.

* Water and Water Supply: chiefly in reference to the British Isles. By Professor D. T. Ansted, M.A., F.R.S., &c. London: W. H. Allen & Co. 1878.

A writer may do good service who, in a like case, brings industriously together all that is really known. The chief defect of the book in this respect is the almost invariable absence of citation of authority. "Communications made to the Institution of Civil Engineers, the Society of Arts, and other public bodies, concerning the storing, distribution, and flow of water," and evidence given before Parliamentary Committees in reference to public undertakings for water supply, are mentioned in the preface, in addition to the Reports of Royal Commissions, as the sources of this information. As far as we have tracked the writer, he has done himself injustice by this neglect of citation. Much that is taken, and faithfully taken, from the Reports of the Transactions of the Institution of Civil Engineers, and of the Institution of Surveyors, would come before the reader with more weight if the sources were made plain. In many cases fuller quotation would have been preferable to the digest given to the reader; as in the instance of the description of the bore in the Severn, of which an admirable account, given by Mr. Parkes, is to be found in vol. v. of the Transactions of the Civil Engineers. For the lecturer, who expects to be listened to as speaking with Academical authority, or for the merely popular writer, exact citation of authority may be to some extent considered as a matter of taste or of honesty. But for the serious writer, for the man who would produce a standard work on any scientific or historic subject, clear, full, and accurate citation of authority is essential. In the present case, the great bulk of the book consists of a topographical account of the various rivers and streams of the United Kingdom. We have read the book with some care, but have failed to find any clear indication given of the data on which this account is based, or the sources whence it has been taken. Those who are familiar with the ordnance map will conclude that valuable survey to be the source in question; but it is unfair to the readers, as well as to the author, to leave a point of this kind, affecting the very marrow of the book, to be mere matter of guess. In one or two instances in this part of the work, indeed, authorities are quoted, as in the case of the account of the course of the Derwent, from Phillips's "Physical Geography of Yorkshire," but these cases are the exceptions, not the rule.

Togographical lists (although it may be said with some justice that topographical survey is the basis of hydraulic engineering) tell us, however, next to nothing about water-supply. The utmost that can be said of them is, that they may serve as a sort of skeleton for the arrangement of future observations. To know the names and the directions of the courses of the feeders of a given stream is no great step towards a knowledge of its hydraulic character. We want to know the area drained in each case. Still more needful, perhaps, is some idea of the profile of the stream. If measurements of its flow do not yet exist, care should be taken to prevent the reader from coming to the conclusion that he is much the wiser for having placed at his fingers' ends an abstract of this portion of the information which is given by a map. As a step, the summaries may be of use; but they will do mischief if they are regarded as more than a mere preliminary for obtaining full information. As to this, however, Mr. Ansted is not even exclusively negative. He says, as to the lake rainfall, "It would be difficult, if possible, to determine any true mean, nor would the determination be of value for any practical purposes." If this be so, why make any observation? Why write anything about water-supply? We should like to hear the comments of Mr. Bateman or Mr. Symons on this statement. Again, the geology of the several watersheds is a matter essential to be known. Not only does the permeability or impermeability of the soil determine the collection of the unevaporated rain into rivers or torrents, but the lie of the strata will at times carry rain that falls within the physical limits of one watershed to supply the springs of another, as in the instance of the Cotswold Hills.

With regard to the general distribution of the kingdom into natural outfall provinces, indeed, a very important step has been taken. The chief drawback to the very valuable annual reports on British rainfall which we owe to the indomitable energy of Mr. G. J. Symons is the adoption, which at first was, no doubt, very convenient, of registration divisions, "which are almost identical with those adopted by the Registrar-General of England and Scotland," instead of the more available divisions of the outfall basins of the country. District No. 1 of the Registrar-General contains 77,991 acres, and appears, from Mr. Symons's map, to have been adopted as his first registration division. But this small area of ground, important as it is as a matter of density of population, forms but a very unimportant fraction of the watershed basin of the Thames, which covers (including the 997 square miles of the Medway district) 6,160 square miles, as Mr. Ansted cites from Sir Henry James. The rainfall of London is chiefly of meteorological importance as forming a part of the rainfall of the whole Thames basin, a natural district, which is divided over portions of six of the "registration districts" of the Registrar-General.

In considering England as physically divided into natural drainage areas, therefore, Mr. Ansted's book has made a decided advance on the usual method of investigating the water supply question. It would, however, have been a graceful recognition of the service of fellow-labourers in the field of research, and have added materially to the claims of the author of "Water and Water Supply" on public acceptance, if the book had referred to the authority from which this hydrographic division of England was taken. To our own readers the subject is not a new one; although so recently as April, 1876, the very valuable maps of the floods in England in 1875, engraved in vol. xlv. of the Transactions of the Institution of Civil Engineers, give no further indication of the existence of natural hydrographic provinces than is afforded by dotting in some of the most noted crests of the water-sheds. It is true that that the indications there given of the areas flooded on the 21st of July 1875, are calculated to call attention to the basins of the Wash and of the Thames. But the very clear division of England, accompanied with an estimate of the area, population, and rainfall of each province, which is to be found on page 42 of the pamphlet on "National Water Supply," published by the Society of Arts in the present year, should not have been passed over in silence by a writer who adopts with exactitude the principle, and the greater part of the details, there laid down. Mr. Ansted has, indeed, arrived at a total of eight, instead of ten, divisions of England and Wales. It is difficult to understand on what principle he has abandoned the systematic arrangement followed in England when he comes to Wales. Minor questions may always arise in making distributions of this nature. Thus the attribution of the Medway as an affluent of the Thames, of which it only enters the estuary at the Nore, is matter rather of convenience than of principle. In the same way the question may arise whether the Usk, which bears somewhat the same relation to the Severn that the Medway does to the Thames, should be ranked with the former, or with the Welsh coast rivers. But there can be no possible excuse for grouping the southward, westward, and northward flowing rivers of Wales, with the long inland course of the Severn. "The drainage area of the Severn," Mr. Ansted says, "includes three-fourths of Wales and large parts of seven English counties." "The total drainage area is 8,580 square miles, according to the map published in the report of the Rivers Pollution Commission." Why 4,420 square miles more, drained by rivers running directly into the sea, one of which forms at its mouth the noblest harbour to be found in the island, should be added to this great natural province it is difficult to guess. Again, the Dee drains 862 square miles. It issues from the largest lake in Wales, which covers an area of 1,352 acres, at a level of 1,000 ft. above the sea; and it "passes into a noble estuary three miles wide, which, at high water, forms a magnificent arm of the sea, being about six miles wide when it reaches the coast. The length of the course of river is about eighty miles, from Bala lake to the beginning of the estuary, and the length of the estuary is fourteen miles." On what grounds this important river should be ranked as an influent of the Severn, of which the estuary is separated from that of the Dee by the whole length of Wales, may well be thought a puzzle. In the division of England into ten natural outfall districts, the Welsh rivers between Usk and Dee form a congruous group. The Dee itself may be most conveniently grouped with the Mersey, the estuaries being almost confluent. "The rivers that find their way into the sea in the estuary of the Mersey," says Mr Ansted, "rise, almost without exception, from the dividing range of the Penine Chain. The whole drainage area of the basin is 1,103,520 acres, or 1,724¼ square miles." The division between the basin of the Mersey and that of the Ribble is a natural feature of this part of the country, and the estuary of the Ribble, Morecambe Bay, and the Solway, form a natural hydrographical group. With these imperfections Mr. Ansted reproduces the exact plan of Mr. Conder, which ought to have been acknowledged.

The next step, after the division of outfall districts, which it is necessary to take in order to arrive at the controlling facts of the water supply, has been indicated, rather than taken, by Mr. De Rance, in a paper brought before the Water Supply Congress of May, 1878. This is the division of the water-shed basins into their geological areas, especially with regard to the permeable or impermeable character of the soil. On this latter element depends, as before remarked, the question whether an overflow shall have the character of a stream or of a torrent. Mr. De Rance has drawn up a table, showing a cross division of England into fourteen river basins and again into fourteen geological systems. But the exactitude which is requisite in order to make this cross division one of practical use is wanting. Thus "various streams and Thames" form one division, containing 9,897 square m les; an arrangement which rather perplexes than enlightens the inquiry into the geology of the 6,000 miles of Thames basin. Again, the oolites are grouped together, as covering 6,671 square miles, without distinction of the four grades of permeable, partly permeable, impermeable, and wholly impermeable, which are given as the respective characters of the great and inferior oolites, the forest marble, the Kimmeridge clay, and the fuller's earth, strata, which together make up the oolite system. Thus, again, the Witham and the Ouse run over a district comprising 3,700 miles of oolitic strata. But from the mere statement of that fact, without distinguishing the permeable from the impermeable beds, but little information is given to the hydraulic engineer.

Mr. Ansted has pursued into minute detail the subject of the analysis of water from different sources. As to this it must be matter of satisfaction to those who would steer an even course between absence of chemical knowledge and absence of common sense to find that the indefensible heading of "previous pollution" is now disappearing from official returns. In the nitrogen existing in water in the form of nitrates and nitrites, Dr. Frankland has imagined that he can detect the evidence of a "previous contamination by sewage," taking as his datum the quantity of nitrogen present in 100,000 parts of raw London sewage. This he calls the determination of previous sewage contamination. Mr. Ansted certainly confronts Dr. Frankland with the irresistible weapon of the *reductio ad absurdum*, and shows that if the theory of previous contamination be accepted, no water will be safe for human dietetic purposes that has not been distilled. The Dover Beck, which enters the Trent a few miles below Nottingham, rises "in very strong springs, yielding from two to three million gallons per day from the pebble conglomerate of the Bunter, or lower part of the new red sandstone. The water, except during floods from heavy rains, receives scarcely any accretions from surface drainage, both the soil and rock being exceedingly porous." It seems incredible to find it stated that, according to Dr. Frankland's analysis, this water is represented as indicating 3,038 grains per gallon of previous sewage contamination. This represents the statement that more than one-twenty-fourth part of the whole volume of the brook was formerly sewage! The entire population of the watershed, according to the census of 1861, was only 391 persons. If we turn to p. 310, under the head of the Basin of the Trent, we find that the course of the Dover Beck is ten miles, and that the area of its watershed basin is 17,981 acres. "There is no evidence [p. 30] that the district was ever more peopled than it is at present." As the density of the population over the basin in question is thus about one soul to 45 acres, it would be difficult to contrive a more absolute disproof of the value of Dr. Frankland's theory. "Previous sewage contamination," says Mr. Ansted, "if a fact, renders analysis useless. It will be observed that the estimate and statement of what has been described by Dr. Frankland as

'previous sewage contamination,' have no real reference to the quality of the water, and that the chemical examination of waters had better be left alone altogether if, as he states, in those samples that contain even the strongest indication of so unpleasant an early history, all calculable and discoverable danger has disappeared; while, on the other hand, those which contain little do so only because,—although really not less dangerous,—they have had the evidence of their danger destroyed."

"The analysis of water, and the various means adopted by chemists to determine, not only the actual elements in their various proportions, but the combinations presumed to exist in solution, is a matter for chemists to determine, and does not," says Mr. Ansted, "at all belong to the plan of the present work." In chapter I., however, our author enters into the very important question of the purification of polluted river water by exposure to air. On this point authorities differ. Dr. Frankland maintains that the waters of polluted rivers are "not rendered potable and safe by any mere exposure to the air present in water." The late Dr. Letheby, on the contrary, remarked "that ordinary London sewage containing 100 grains of solid matter to the gallon, of which 14 or 15 grains are organic, mixing with twenty times its bulk of ordinary river water, and flowing a dozen miles, contains no quantity of sewage discovered by any reliable chemical process." The late Professor Miller, of King's College London, took specimens of Thames water in 1859 at Kingston, at Hammersmith, at Somerset House, at Greenwich, at Woolwich, and at Erith, on the same day, and examined the quantity of oxygen in each. At Kingston it was the ordinary and normal proportion usual in Thames water; at Somerset House the proportion was much diminished; at Greenwich the whole of the oxygen had disappeared; but at Erith the water was already much improved.

The most novel contribution made to this conflict of opinion is one of which we shall gladly hear more. "Dr. Tidy has recently made a series of laboratory experiments on the rate of oxidation of disturbed sewage water, and is still pursuing these important investigations. I am informed by him," says Mr. Ansted, "that at the present time his results prove that when water containing one pint of ordinary London sewage added to twenty parts of water was allowed to fall slowly from a height of 17 ft. in five minutes and a half through the air a certain number of times the result was as follows:—

	Grains.
Oxygen required to oxidise organic matter in dilute sewage at commencement of experiment	1·563
After 10 falls, oxygen required	1·120
„ 20 „ „ „	0·820
„ 30 „ „ „	0·633
„ 40 „ „ „	0·486
„ 50 „ „ „	0·352"

We confess our inability to understand how water can be "allowed to fall slowly from a height of 17 ft. in five minutes and a half through the air." Still it is clear that some actual experiments are alluded to; the result being, as we take it, that organic matter contained in water is oxidised when that water is allowed to pass through the atmosphere in a jet, and that at a rate represented by the figures given. We should be glad to have an intelligible account of the experiments in question. It does not follow that if a dribble or a jet of water is rapidly acted upon by the air that a volume of water flowing in a pipe, or in a channel exposed at the surface, would be acted upon in the same way. The distribution of the effluent water in the form of a more or less minutely divided spray would be likely to have a powerful effect upon its quality. Results thus arrived at might throw light on the question of the oxidising that occurs in river-flow, especially if weirs are introduced. On the other hand, they might prove to be regulated by such conditions as to render comparison unavailing. Mr. Ansted expressed the hope that he should be able to insert an account of the further experiments of Dr. Tidy in an appendix. This has not been done, and we can only regret that, as the subject has been so far brought forward as to yield numerical results, we have not some description that would enable us to form an idea of the mode in which the experiments made by Dr. Tidy have been actually conducted. For our own part, we can say with justice that the report submitted to the Society of Medical Officers of Health by Dr. Meymott Tidy in January last is a little work of a nature calculated to give confidence in any thing proceeding from that gentleman's pen. At the same time, nothing can be more unwise, in a case of such extreme importance, and such admitted difficulty, as that in question, than to accept a summary statement of the "results" of experiments without fully understanding in what manner the experiments have been conducted.

The general features of the meteoric supply of water, and of its subaërial flow, are discussed in Chapters 1, 2, 3, and 18. The intervening chapters are devoted, as before intimated, to the topography of the various drainage areas, not alone of England, but also of Scotland and Ireland. The illustrations include an outline map of the drainage system, of which we have already spoken. Another sketch, showing the distribution of rainfall in the British Islands, appears to have been copied directly, except in so far as regards the rude, coarse style of execution, from the Hydrographical Map of the British Isles, by G. J. Symons, which is to be found in the Transactions of the Institution of Surveyors, vol. ix., part vi., although, as in the former case, no acknowledgment is made. There is also an outline map of the geological structure of the British Islands. These maps are on the small scale of eighty miles to the inch, but the omission of details reduces them to mere general illustrations of the text. Sketches of fourteen drainage areas, on a scale of twenty-five miles to the inch, are apparently copied from the map in the Sixth Report of the Rivers Pollution Commission. Without claiming accuracy of definition, they serve to explain the chapters to which they correspond. The outline map showing the chief elevation axes of the British Islands, though simple to the degree of rudeness, is well calculated to give a notion of the general lie of the physical features which constitute the natural outfall province. The chief defect of this map is the want of any indication of watershed, or division of any kind, in such cases as the boundary between the great central plain of England and the lower basins of the Thames, the Wash, and the Humber. As far as the mountain axes are indicated, a sort of trough reaches from the Tees to the North Downs, hemmed in by the Penine chain, the Cheshire hills, and the Cotswolds on the west, and by the Cleveland hills, the Wolds, the Fens, and the Chiltern hills on the east. This gives a notion of an orographic structure resembling that of Ireland, and hardly enables the student to form a correct idea of the skeleton arrangement of the watersheds. Mr. Ansted says,—"A study of the outline map of elevation axes, which indicates in a simple manner the principal lines of ridge, hill, or mountain, without reference to river basins, will show, better than any description, when compared with the outline maps of river basins, geology, and rain, how completely the physical geography and geology of Great Britain correspond with the hydrography." The idea is an excellent one. But it requires either the definition of contours (if as much as 200 ft. apart), or the presentation of longitudinal and transverse sections of the island, in order to be fully available for the guidance of the student.

There is a good index, and the contents of the chapters are so divided into numbered paragraphs as to faciltate reference. The rain-distribution map at the commencement of chapter xi. is intended to illustrate, by showing the relative rainfalls in the British Islands. We presume that this map has been introduced by the kind permission of Mr. Symons. If so, due acknowledgment should have been made. If otherwise, the authorities should have been cited. The difficulty which is thrown in the way of the reader who seeks to verify any statement made by Mr. Ansted is the main fault of the book, and it is one from the presence of which the author is even a greater sufferer than the reader. It is especially to be noted in all that refers to rainfall. Thus under the head "Rainfall Distribution," p. 62, will be found copious extracts, without acknowledgment, from the general tables of foreign rainfall, at p. 80, of "Rain: How, When, Where, Why, is it Measured?" published by Mr. Symons in 1867. At p. 67 a difference of opinion between Mr. Glaisher and Mr. Symons as to the value of calculations of averages is mentioned, which, we rather think, is wholly imaginary. The authority for the statement, "it has been concluded that, other things being the same, the increase" of rainfall "is about 2 in. per 100 ft. rise above a given level" is desirable. We rather think the usual and preferable rule is a diminution of 3 per cent. of the low-level fall for each 100 ft. If Mr. Ansted has been in the habit of recommending gauges for rain to be made by a tinman, "at the expense of a few shillings," it is not matter of surprise that he attaches so little value to the results of observation. As to this, indeed, we may note that the statement as to the register of a rain-gauge in the valley of the Tarn beck is curiously erroneous. Near Seathwaite tarn, says Mr. Ansted, "is the spot where the heaviest rainfall in western Europe is recorded. A rain-gauge in the valley has registered 160 in. in the year, and in one month 30 in." The fact is, that there are two Seathwaites. The wet one is at the head of Derwentwater, and has nothing to do with the river Duddon, into which the Tarn beck flows. There is a reference to Seathwaite fell, a little later, as the site of a source of the Derwent. The actual figures are given in the Report of the Royal Commission on Water Supply, and are as follows: The Stye, 1,077 ft. high, rainfall in 1866, 224·86 in.; Seathwaite, 422 ft. high, rainfall in 1861, 182·58 in. But in 1872, 243·98 in. fall was registered on the Stye.

THE CONSERVATION OF ENGLISH ART WORK.

A TOPIC of considerable importance, in regard to the preservation of our English decorative art as a national possession, has been here and there agitated of late,—the possibility, namely, of our being surreptitiously deprived of a great proportion of the remains of such works which are in private collections in this country, in the course of the increasing tendency, amounting with some persons almost to a mania, towards the collection at all cost of the best attainable productions of the art of other times and other countries than their own. It is probable that this particular taste (we do not wish necessarily to stigmatise it as a "mania") hardly ever ran so high, or certainly not for a very long time since, as it does at present; and among Englishmen, especially the possessors of recently acquired wealth, it seems to run highest. Most of us have been witness to the assiduity of some neighbour or acquaintance, blessed with a large banker's balance, in collecting all the specimens he can come across of the national art-work of some particular age and country, or even some particular class of article or material which the collector either especially admires or which he thinks no one else appreciates or possesses,—for this latter feeling, the desire to possess what other people have not, seems to be as powerful an inducement as any other with "your collector." The better phase of "collection," however, arising from a real admiration for what is good and characteristic in old decorative or industrial work, wherever to be found, is by no means unusual among Englishmen, who will often go out of their way and expend a great deal of pains, when travelling in country-places abroad, in endeavouring to unearth old specimens of native art. Then such a collector comes home, and it spreads among his friends that he has really made the best collection of old Scandinavian candlesticks that is known in this country, and his name finds its way into the columns of artistic journals as what would once have been termed a *virtuoso*. And if the articles are of beauty and of archæological interest, so much the better, from our point of view, that a native of our country should have imported them. But the question may be asked, on several grounds, is it desirable that the country whence these treasures have been brought should thus be deprived of its specially national art-relics in order to gratify the pride, curiosity, or æsthetic taste of an individual of another country, in exchange for coin which cannot really represent their value except in a merely commercial sense, since they are things unique in kind and irreplaceable by any modern hand? And if this consideration touches us not, how does it appear if we reverse the case, and suppose the man of taste from another country, going about our districts armed with his irresistible cash, and carrying off to his private collection, and far out of our reach, the best and most characteristic productions of the artistic minds and hands of the England of the past?

This particular aspect of the subject was brought forward the other day in a letter to the *Times* by a correspondent whose opinion is of some value on such a topic, on this account at all events, that he is himself known as a collector

and connoisseur, and therefore (on the principle of "set a thief to catch a thief") is likely to know something of the ways and doings of this portion of humanity, more than is known always to those who do not profess collection. And what this member of the fraternity* hints at as a possible result of a slight turn in the direction of the current of collection is really rather a serious matter for any one who considers that the art-productions of a country are a part (and perhaps the most interesting part) of its vital history and existence. He tells us that many are not aware how much the tide of collecting is setting from this country to foreign shores, so far at least as paintings are concerned, in comparison with the circumstances of ten or fifteen years ago.

"At one time English gold carried away everything, even from the most ardent amateurs of France and Germany, but now the wealthier successors of these latter, or their agents, come over to us and literally ransack this country, bringing to the task an amount of taste, knowledge, and enterprise which shames and overshadows us. Already they have found the way into not a few of our lordly homes, —the proud ancestral homes where to hint even at a wish to purchase would once have been deemed an unpardonable insult. The inevitable temptation which in former times reduced the galleries and cabinets of many a high-born Italian duke or French marquis almost to the level of a standing curiosity-shop has, in fact, begun to cast its spell even over our own nobility. Who, indeed, can resist when the value of a landed estate even is eagerly preferred for a single picture, a cabinet or a vase? People who know will be well aware that in this I am drawing no exaggerated picture. As yet, however, monuments of art, other than pictures, have not, as a rule, been coveted by foreign collectors; but any day the fashion might suddenly arise in Continental art circles for old English plate, furniture, miniatures, Chelsea china, &c., and then in a year or two almost every notable specimen might be swept out of the land."

To which we may well say, with Snout, the bellowsmender, "By'rlakin, a parlous fear!" In regard to the abduction of paintings from this country in exchange for fine gold, there are two considerations to modify our regrets. The one is, that the paintings most sought after are probably not those which are racy of the soil, but those productions of foreign artists which have in times past come into the possession of English owners by purchase, and perhaps in some cases, therefore, are going back to their native soil; and, at all events, their loss makes no gap in the history of our own art. The other is, that an old picture of any high value, and the work of a master, though transferred from one owner to another, is seldom lost to view, so to speak: persons interested in art, and conversant with the doings of the art world, know where such and such a picture is, and it can eventually be repurchased if occasion arises, and is, at all events, often accessible enough to those who have a good reason for asking for the sight of it. But it is otherwise with works of decorative art, in most cases with no manufacturer's or artist's name, and no distinguishing subject or name by which they could be traced, as a picture can be traced; and therefore, unless in such a case as a noted collection purchased as a whole, articles of this kind sold out of the country are lost, except for the mere chance of their turning up again at some future change of ownership.

If it be asked what steps we are to take to counteract any such wholesale pillage of the art of the country by foreign *dilettantism*, supposing the taste for the possession of English decorative work should develop to the extent suggested above as possible, it seems hardly possible to suggest anything beyond endeavouring in a general way, and at every opportunity, to quicken the public interest and pride in the possession of works of national art. Even in regard to works which are not the product of our own race, such as the paintings of the great Italian masters, it might be thought that there should be some pride as well as pleasure in their possession, and that it indicates a very lamentable declension in tone and feeling among the aristocracy of this country, if it be really true that they are becoming willing to barter for cash masterpieces of art which have been the pride of their families, and through them of artistic England itself, for many generations. It is on record somewhere that Cromwell, who knew and perhaps cared little enough about art himself, was stimulated to retain the Raffaelle cartoons for the nation, chiefly in consequence of the inadvertent remark of the Spanish ambassador, who was commissioned to treat for them for Spain, that it would be "a glorious thing" for the king, his master, to possess those pictures. In the mind of Oliver it appeared that if there were any glory in the matter, it should be for England, and not for any foreign country. It has been matter of pride that this country possessed in its "ancestral halls" almost untold riches of the finest schools of painting,—how great, the loan exhibitions of late years have afforded to the general public but a partial indication. The possession of such works by Englishmen should surely be rated at something more than their mere money value, unless we are to conclude that the desire of amassing wealth has spread from the *nouveaux riches*, and is infecting the whole community, and swamping the hereditary and traditional feelings of English gentlemen. But, at all events, as we have said, if such works as these are leaving the country, we shall probably know where they are; but if a raid should be made upon our decorative art, it may disappear almost hopelessly, as far as we are concerned, and such art, whether it be gold and silver work, furniture, potters' ware, lace, embroidery, or whatever else, embodies a very important part of the history of the taste and manners of the nation at various periods, and should be considered a matter of national interest. In the hope of awakening a more general interest in the subject, as well as of arriving at a fuller knowledge of what we and others really do possess of English decorative and industrial art, we cordially welcome and recommend the suggestion which has been made in the course of the correspondence above referred to, that there should be held in a year or two a loan exhibition purely of Old English art of this description, to which every one possessing examples of the decorative art of this country (say previous to the present century), should be earnestly invited to contribute; and that the same invitation should be extended to all possessors of English work in Europe. It is more than probable that there are scattered about Europe many rare treasures of English workmanship of which we know nothing. In mentioning the proposition with approval, we will endeavour to advance it a step further by suggesting the actual place for the exhibition, viz.,—the galleries in Exhibition-road, or a portion of them. Several International Exhibitions have been held there: why should we not now have a National Exhibition?

* Mr. J. C. Robinson, whose name was recently prominently before the public in relation to the authenticity of the Madonna dei Candelabri, said to be by Raffaelle, of which he claimed to possess the real original.

AT THE PARIS EXHIBITION.

VASES AND VENTILATORS.

IT is not surprising that prize medals are awarded to Messrs. James Stiff & Sons and Messrs. Doulton, of Lambeth. Nothing could be more natural or better deserved; for, as we have remarked on numerous occasions, England has won universal admiration by its hardware and pottery, taken both from the utilitarian and the artistic point of view. Perhaps the latter quality is the newest feature of our home industries; and it is no small credit that we should make so many and such successful efforts to acquire the taste and artistic instinct with which, as a nation, we are not abundantly gifted. The manufacturers who have helped to bring about this result have had to fight an uphill battle, and we are glad to note that their perseverance has won the approbation of the most difficult of all tribunals, an international jury. Messrs. Stiff have some decorated salt-glazed stoneware vases, &c., edged and painted in a refined style, in which the seagreens and dead blue colours predominate, together with effective turquoising. Ornamental vases, of varied design, notably an owl pattern and Renaissance vase, have attracted much attention; while salad-bowls, salt, and pepper-castors, goblets, tankards, &c., prove by their moderate price and their beauty how easily art may be associated with the commonest exigencies of every-day life. This particular ware need only be placed once in the kiln in the course of manufacture. The paint, the glazing, all is put on the raw clay, one baking sufficing to produce a perfect article; and the contemplation of these objects manufactured simultaneously with hundreds of miles of drain-pipes, countless air-bricks, tiles, &c., is, to say the least of it, a grateful relief to the eye. But the latter and more prosaic wares are, on their side, equally worthy of comment. The patent damp-proof course is, for instance, an undoubted improvement. A perforated course admitting through ventilation is a comparatively old idea; but in practice it was found that the damp came through the joints, instead of being carried away in the air-passages, as it was more easy to force its way through the former than into the latter. The patent in question obviates this difficulty by making the joint over and under the centre of one of the air-passages, so that the damp, having forced its way through the first joint, is carried off by the current of air in which it must then fall before it touches the other joint. Again, we have Stiff's white glazed enamelled sink, which is not absorbent, like the old stone, and can, therefore, be kept perfectly clean. Finally we should not omit the patent "intercepter" sewer-air trap. This is an entirely new invention, with which, however, our readers are probably familiar, though it has not been before the public for more than some few months. It is an ordinary syphon, which can be inserted in any drain-pipe anywhere between the house and the sewer. A ventilating-shaft communicates with this syphon, and may be concealed either among the bushes of the garden, carried to the roof of the house, or otherwise disposed of. As the mephitic air arrives from the sewer, there is immediately above the water-level of the syphon an opening by which it can escape into the ventilator, or which may be closed and used only for cleaning purposes. This first opening being closed, the gas will then force its way into the water of the syphon; but here it will be intercepted by a diaphragm, which dips some 3 in. below the water-level, and carried up to a little chamber communicating with the ventilator. Behind the intercepter is the communication with the house-drains. The question is, whether the gases are likely to dive deeper than the intercepter, and thus rise up in the house-drains. There are answers, however, to this supposition.

From this exhibit we wandered to that of another firm close at hand, which also combines art and utilitarianism. Messrs. Verity Brothers are well known for their artistic *repoussé* work in brass and copper, and they have recently patented a ventilator or air-propeller, which was described a few weeks ago in these columns. The most notable feature of their art exhibit is that precisely which is the least noticed; or for which, at least, they but rarely receive credit. This is a magnificent brass *repoussé* fireplace, of old design, a marvellous piece of workmanship, both as regards the ideas and their execution; but it forms part of Messrs. Howard & Sons' striking collection of artistic furniture hangings, wainscoting, &c.; and it is not every one who can distinguish that the furniture, walls, and drapery belong to one firm, the brass *repoussé* work to another. Nor does the catalogue throw any light on this matter; but, in any case, the two firms have between them produced a good effect, and daily attract crowds of visitors. Nor had these objects been exhibited many days before they found a purchaser. The fireplace and its surrounding furniture are destined for the dining-room where Mr. Wilson, the member for Hull, will in future assemble his guests.*

Concerning the air-propeller, we have made several careful experiments to test its real power. This, of course, depends on the jet of water which is forced through an aperture about the size of a pin by the pressure derived either directly from the main or merely from the cistern situated at the top of the house. The latter is the weakest and the least expensive. According to the pressure brought to bear, the consumption of water may vary from three to twelve gallons per hour. As in town water costs tenpence per 1,000 gallons, the outlay for motive-power is insignificant. The pressure of water at the Paris exhibition was very slight, and the current of air created by the fan-wheel thus set in motion was so feeble that it gave a very false idea of the efficacy of the invention. In London we were able to give the implement a better trial. Our first experiment was made with pressure derived from the main. The aperture measured 6 in. by 4 in., and we found, with the assistance of J. H. Steward's anemometer, that the air came in at the rate of 990 ft., or, let us say, 1,000 ft. per minute. This gave us, therefore, a column of air 1,000 ft. long, 4 in. deep., and 6 in. wide, per minute, or, in round numbers, 10,000 cubic feet per hour. Our next experiment was with house-pressure, derived from a cistern situated 35 ft. 4 in. above the apparatus. The anemometer now only recorded a velocity of 700 ft. per minute, which was equal to a volume of about 116 cubic feet per minute, or, within a minute fraction, 7,000 cubic feet per hour.

* A view of this fireplace will be found in our present number, in addition to our ordinary cuts.

Dr. Angus Smith estimates that town-air contains 0·04 per cent. of carbonic acid. One man, by breathing for one hour, would infuse the same quantity of carbonic acid gas in 1,000 cubic feet of air. If this was town-air, it would, therefore, contain 0·08 per cent. of carbonic acid at the end of the hour. It would have become twice as impure as the external air, and at this point we may draw the line, and consequently conclude that for each adult we must provide 1,000 cubic feet of external air per hour. With the assistance of Verity Brothers' ordinary sized ventilator, we could, therefore, obtain, over and above the ordinary supply, enough air for ten or for seven persons, according to the pressure brought to bear. This is an enormous addition for an ordinary room, where the windows, doors, chinks, chimneys, and anything but air-tight walls, are unfortunately considered by most people sufficient in themselves. But we need not limit ourselves to one apparatus. Several may be inserted into one room, and some placed on the level of the ceiling, which work in an inverse sense and act as suckers to draw the air out. There are, however, many problems involved in the placing of these ventilators, and no fundamental rule can be laid down to decide how they should be used. The disposition of the room, its angles, its furniture, may alter the course of the air currents, and render even violent ventilation comparatively ineffective. On this point we must reserve our judgment till we have had more ample opportunities of judging the manner in which Messrs. Verity apply their invention. At the present moment, they are fitting up the Reform Club with their patent air-propeller; and when this work is completed we may be able to ascertain how far these useful ventilators have been scientifically and successfully employed.

Mr. James Hamilton, of Rochdale, also exhibits a ventilator which has the advantage of simplicity; though it must at the same time be stated that the idea is but a simplification of what already exists. It is a cowl, so contrived that a down-draught is, it is said, impossible. The top of the shaft, or chimney, is protected by a cone or disc, which prevents the rain falling down; but it has been found that this old contrivance obstructed the currents of air deflected by roofs of buildings, and pressed them down the shafts with great force, thus producing the dreaded down-draught. Hamilton's patent consists simply in placing below the top of the ventilating-shaft a deflecting plate, which stops the up-current of air as it rushes along the outside of the shaft. This is so contrived that the air entering between the cone and the lower disc must strike an obtuse angle, which will carry the down-current beyond the shaft, and thus prevent a down-draught. This principle can be applied, not merely to shafts and chimneys, but to the entire length of a roof; if it is judged expedient to make an opening several feet long, by which the air will be drawn out without down-draught. The whole question of cowls, however, is just now in debate.

In close proximity to this invention are the well-known and useful Archimedian screw ventilators, patented by James Howorth, of Bolton and London. This contrivance is so familiar that we cannot dwell at length on the subject. At the same time we must also protest that we were unable to find the representative of the firm at the Exhibition. We should have been glad to record any new experiments made to further confirm the efficacy of this now somewhat ancient invention; but there was not much evidence of this character forthcoming. We are informed, however, that the ventilator was applied to the soil-pipes of the Union Bank offices at Brighton a few months ago, and most effectually extracted and scattered the sewer-gas. When the screw which produces the up-current is made to revolve by steam-power it will draw from a factory or other building from 2,000 to 10,000 cubic feet of air per minute. These calculations, based on the evidence given by Mr. Howorth himself, we had unfortunately no opportunity of confirming during our visit to the Paris Exhibition building.

In conjunction with these inventions, we should mention the very good display of Boyle's self-acting air-pump ventilators, which are so prominently placed that no one can pass in the section without noticing them. These were invented in 1869 by Mr. Boyle, with a view to reducing the rate of mortality, which had been particularly high that year in Glasgow. This ventilator, it is well known, has no mechanical movements or working parts that can possibly get out of order, requires no attention, and cannot lose its power through neglect. It consists of four similar sections, acting separately, and catching the wind as it comes from either of the four quarters of the globe. The air on entering one of the sections of this cowl or ventilator strikes the point of an angular-shaped louvre plate or diaphragm, and is consequently deflected at varying angles over the central radial plates. A down-draught cannot occur, and the deflection of the wind causes a suction which draws the air up the shaft. The rate at which the air travels must, however, depend on the strength of the wind; and this is the chief objection that can be made to this form of ventilation. Thus, some experiments made at Mr. Boyle's office with one of his ventilators attached to a 6-in. pipe or shaft showed that, on one occasion, when the wind was blowing a gale, the suction produced was so great that the air travelled up the pipe at the rate of 1,235 ft. per minute. On the other hand, when there was a calm the air would not move faster than 220 ft. per minute. The average up-draught is, however, estimated at a velocity of 740 ft. per minute: equal, we believe, to 150 cubic feet; and, undoubtedly, the extraction of 9,000 cubic feet of air per hour must render great service in maintaining the wholesomeness of dwellings.

Finally, we cannot conclude our remarks on this subject without also congratulating Mr. Banner for exhibiting his system of ventilation, though this is done in a manner that we fear will not be considered very intelligible by many foreigners. Mr. Banner may boast of having combined various ideas, initiated by others, but not previously brought together, so that they might derive increased power by their union. Mr. Banner traps the drains near to their fall into the sewer; he ventilates the closets, not merely by a tube or shaft, but renders this truly effective by providing an inlet for air into the shaft, and by placing a cowl which will attract the air in, through, and out of the shaft. Thus there is no accumulation of foul air in the shaft, which often renders this contrivance worse than useless. This, and the other systems we have mentioned, conclusively prove how deeply the question of ventilation has been studied in England; and in this matter, at least our section at the exhibition is pre-eminent.

INTERIOR ECONOMY OF THE OFFICE.

HAVING enunciated the three chief rules of interior economy, and set forth how they may, in our opinion, be best observed,* it remains to treat of those minor points which, though small in themselves, yet play no insignificant part in the development of a proper system of office economy, by which delay, trouble, and research, waste of time, money, and temper can be reduced to the lowest possible degree.

And here it may be well to raise a voice of warning, and point out that while those who steer farther from Scylla are, as a rule, only in greater danger of running on Charybdis, so the professional man, by becoming too particular and precise in office *régime*, runs the risk of becoming lax in weighty and important matters, to the detriment of that business he seeks to benefit.

Office economy must be looked on solely as the means to the end, the end being the development of talent and abilities to the utmost and to their widest and most bountiful use, the attainment of the quiet frame of mind that habits of order and regularity, when properly cultivated, seldom fail to induce, and the general regard that will most assuredly be obtained from not only all clients and patrons, but also those who may have business connexions of any kind with the office, and—as an outcome of all these results—a fair proportion of success in life.

Bis dat qui cito dat, and double satisfaction will the architect or engineer afford who, by return of post, so to speak, can give the information asked for, instead of the usual reply "that such and such a document has unfortunately been *mislaid*,"—the word *lost* being, in professional phraseology, apparently obsolete!

Of the minor points of our subject the principal would seem to be as follow:—

1. How best to arrange for and supply, as wanted, the paper of various kinds that will daily be required for the reception of the thoughts and workings of the minds and the creations of the hands of yourself and your *employés*.

2. How best to arrange and keep the instruments, colours, and other adjuncts of a draughtsman, so that they may be ready to his hand at any and every moment, and calls made neither upon his attention nor his time in perplexing and irritating search.

3. How best to arrange and keep the plans and drawings of those subjects that may be in hand, so that they may be readily taken up and laid down again without trouble or confusion.

4. How best to arrange and keep the "Field" books, in which your out-of-door measurements, surveys, and notes are recorded, so that they may be referred to at once, and whenever desired.

5. How best to arrange and maintain that your *employés* enter their daily work, so that your clients are justly charged, and that you yourself are credited with fair reward for your labours.

6. How to maintain a proper system of accounts, without which, indeed, all other rules, followed out in their entirety as they may be, are as nothing worth.

1. Whatever your fancy or requirements under the head of "paper" may be, it is well to lay in and always keep on hand a good stock in some appointed and suitable place, and in charge of a particular *employé*, who will deal out as may be wanted to the others; for where each individual in an office can go and forage for himself confusion and waste will inevitably result. It will be the duty of this *employé* to see that the stock of any particular nature never runs too low; and, to avoid mistakes, a sample sheet, &c., of each kind should be always kept, and, being marked "sample, to be returned," forwarded, where practicable, with the order for a further supply.

Under the head of stationery must be classed also glass-paper, drawing-pins, tape, paper-fasteners, sealing-wax, gum, ink, colours, blotting-paper, pens and pen-holders, pencils, brushes, india-rubber, string, labels, &c.; these articles being in charge of one individual and served out whenever necessary.

The prudent man will, in the case of stationery, settle on no more different natures than are absolutely necessary, and will keep to them, and the firm who supplies them, until he is perfectly certain he has found better.

The headings for all note-paper will be plain and suitable, no flourishes or ridiculous designs, and yet none of that pride which apes humility; you merely want your name, profession, and address to be read at a glance by all, high and low, with whom you may chance to have communication.

The ordinary "*papeterie*," placed on the writing-table before you is, perhaps, as suitable a receptacle as you can have for your writing-paper, &c., and should contain foolscap and common-sized note (headed, plain, and, if you are entitled to it, crested also), with envelopes to match, book of stamped telegraph forms, post-cards, packet of post-office order forms, stamped newspaper wrappers, and, in the drawer beneath, receipt stamps and postage stamps,—the latter not in sheets as you received them, but all single, so that when in haste to catch the post a stamp is always ready to the hand.

As for fancy-sized or fancy-tinted stationery, the office of a business man is no place for it; let it serve for the correspondence of schoolgirls and effusions of lovers, who are not supposed to have a thought towards expediting the postal transmission or delivery of letters.

Without doubt the compulsory use of envelopes of certain sizes would be a great feature in post-office economy, for the labour of sorting, transmitting, and delivering must be seriously increased by the indiscriminate use of fancy stationery.

Drawing-pins are, in many an office, a source of continual trouble. They may, however, be easily kept in small wooden or metal cups, attached by a screw to the under side of the table, and pivoting on the same, just as chalk is kept under a billiard-table.

Such a drawing-pin cup may be affixed at all four sides of the table, and thus all stretching for or passing of pins from one draughtsman to another is happily avoided.

Ink is an article which meets with, as a rule, but scant ceremony, being generally exposed in wide-mouthed bottles to the ready admixture of dust and dirt. The thermometer ink-bottle

* See p. 930 *ante*

(simply on the ordinary bird-fountain principle) is the best we know of, for the volume of ink being large, loss by evaporation is reduced, while the surface exposed being very small, little chance is afforded for admixture of dust, &c.

We are surprised these simple and efficient bottles are not in more general use; we have tried to procure them in vain in many of our large towns, yet they are not uncommon in British India and elsewhere.

We should imagine a triple thermometer ink-bottle for registration, copying, and red ink, would command a ready sale, and well remunerate the manufacturer who may care to introduce it.

2. Drawing-instruments, colours, &c.

Most draughtsmen prefer using their own nstruments, each having a separate case to himself; but where this method does not obtain, a good one is to have fixed against the wall at a convenient height, a cabinet (resembling a gentleman's wardrobe in miniature), each little shelf, or rather tray, of which is labelled respectively, "pencils," "brushes," writing-pens," "india-rubber," crow-quills," "compasses," "bow-pens," &c., while one shelf is marked "for repair."

Each room in the office that is used for drawing purposes should possess a cabinet of its own, similar and similarly labelled in every respect, so that it would be possible for any *employé* to go to any of the cabinets in the dark, if required, and at once lay his hand on an instrument of any particular sort.

As any instrument becomes broken or damaged, it is at once placed in the "repair" tray to be attended to at the next opportunity.

A great advantage of the cabinet system is that, if through carelessness or accident any instruments are left lying about, the first *employé* who may come across them, or even the office boy or old woman in charge, can at once put them in places where they will be ready to the hand, whether required next day or next month. Underneath the cabinets should be fixed small drawers, with zinc trays inside, triangular in section, and divided into compartments, each duly labelled with the name of a colour.

The colours (in cakes) are thus quickly found, readily grasped by finger and thumb, and easily removed, to be as easily returned.

Scales are a class of drawing instruments that give a good deal of trouble, especially when the nature of the business involves the use of many kinds.

You go to the scale-box wanting a particular scale; you may take out half a dozen, one after another, before you get the right one, or after reading every one in the box, find the particular one you require is absent.

Alongside every cabinet a scale-rack, made in the following way, should be fixed:—A piece of deal or other board is taken, the width corresponding with the length of the scales, and as deep as required. On this board slips of deal, grooved top and bottom, are nailed horizontally, and at a distance from each other sufficient for a scale to be slidden easily between. Over these slips a piece of board corresponding to the first is fastened, and then in the centre shorter grooved slips for the "offset" scales; over these a facing-piece, and the rack, varnished and labelled, is complete.

To facilitate the removal of the scales with the finger and thumb, the boards should be, to use a heraldic term, ingrailed at the sides.

Labels suitable for cabinet-trays and scale-racks are sold at most stationers', ready gummed, in boxes of 1,000, principally for use in drapers' shops.

Tee-squares, set-squares, curves, protractors, &c., are best hung on nails in the walls, care being taken, as also with cabinets and scale-racks, to avoid the neighbourhood of flues, the heat from which might cause great injury.

3. Plans and drawings "in hand" generally manage, even after the lapse of only a day or two, to get completely out of hand, and thus a general unrolling and rolling-up of all plans in the neighbourhood is ever going on in search of what is wanted, to the annoyance of such draughtsmen as may be at work in the room on other subjects, and to the waste of much valuable time.

Here the "plan-bin" system may be advantageously adopted, but with this difference, that whereas the plans in the attics, &c., are exposed end on, plans in hand should be kept, for the sake of economising space, *parallel* to the walls. In fact, the plans-in-hand-bin is in reality but a magnified skeleton scale-rack, reaching from floor to ceiling.

As each piece of work, where drawings will be required, is taken in hand, the name of the work is printed in large type on a slip of stout paper, and affixed by small drawing-pins to the outside of the uppermost of the series of allotted pigeon-holes, the remainder being labelled "Ditto." In this way plans in hand and on reference may be laid aside and resorted to in a moment by any one in the office.

After the happy completion of the work, the drawings are duly numbered, rolled together, and transferred to the attic bins, leaving room for fresh plans and drawings, the label being reversed and inscribed with a new title.

4. With regard to "Field" books, which generally, from the rough usage and soiling they have to endure, cannot (unlike your bank-book, for instance) be permanently inscribed with any title or designation, a simple plan is to affix consecutive numbers, cut out of sheet zinc, to their covers by means of the ordinary paper-fasteners.

The books, all being of one size, are kept on an allotted shelf, and an alphabetical index-book (which may be No. 0 field-book, if you like) will tell you at once which is the field-book required.

An improvement would be to have a field book-case made, with, say, ten pigeon-holes in a row and as deep as necessary. In the topmost row, books No. 0 to No. 9 are kept; in the next, Nos. 10 to 19; in the next, Nos. 20 to 29, and so on. So that, should you require a particular book, you could at once go to the units, tens, or twenties, &c., row, as the case might be, and take it without hesitation. In allotting a separate pigeon-hole to each book, a great advantage is, that an empty pigeon-hole will tell you at a glance what book may be missing, and lead you to make due inquiries for the same.

Nos. 5 and 6, minor rules, bearing as they do on the financial part of office economy, are reserved for future consideration.

A STEAM "NAVVY."

THE application of steam power to the execution of earthwork is a subject that has for some years engaged the attention of the civil engineer. To that mode of applying power, indeed, we owe the execution of the Mont Cenis Tunnel. The experience gained in that great work has led to so much improvement in the construction and the manipulation of automatic rock-cutting instruments, that the estimates for the St. Gothard Tunnel were considerably lowered in consequence. It is now some time since we have heard anything of the application of mechanical means to the cutting of coal, from which great economy was expected to result at the time when coal last attained its maximum price. The excavation under water by the application of the steam dredge is not only convenient, but highly economical. The steam plough has shown how it is possible to open a furrow, or to turn up a broad surface of soil, with far less expenditure of power than by the application of a horse-plough, or of a spade and pick worked by hand. And now we have an account of a more comprehensive attempt to apply mechanism to excavation in a machine made by Messrs. Ruston, Proctor, & Co., of Lincoln, which has been christened the "Steam Navvy."

No less than four engineers have made communications to the Institution of Civil Engineers illustrating the construction and cost of working of the steam navvy. These papers, which will appear under the section "Other Selected Papers," in the next quarterly volume of the "Transactions of the Institution," are respectively by Mr. Charles Douglas Fox, by Mr. James Brand, by Mr. Henry Michel Whitley, and by Messrs. Ruston & Proctor. There is also a very brief paper on the same subject by Mr. C. A. Harrison.

Looking at that which will first command the attention of those who need the services of the navvy, whether fed with coal and water, or with beef, bacon, bread, and ale, we observe a wide range of estimate to be offered, which requires some kind of explanation before the papers in which it occurs can be regarded as standard contributions to the literature of the profession. Messrs. Ruston & Proctor state that they "have even been informed that the stiffest clay has been excavated and filled into wagons with a working expense of 2d. per cubic yard." Nothing, however, is adduced in justification of this remark; and in the absence of some confirmatory data, those of us who draw our experience from the cost of the old navvy will think that it had better not have been printed. Mr. Fox gives particulars of the employment of the steam-navvy on the West Lancashire Railway, from July 17 to December 31, 1877, during which time the engine worked for ninety-three days, and excavated 22,209 cubic yards, or 239 yards per diem. The cost of working for this time, including fuel, labour, stores, cost of repairs, and an allowance for depreciation of the machine at the rate of 25 per cent. per annum, was 874*l*. Mr. Fox observes that during the whole period quoted, 24,000 cubic yards of material have been turned out of the cutting, including some wagons filled by hand, at a cost of 8¼d. per cubic yard. Messrs. Ruston & Proctor state the cost of excavating the same material by hand at 10¾d. per cubic yard. The material was a stiff brown clay throughout, free from large stones. The price of contract work must have enormously advanced since the construction of our main lines of railway, if 10¾d. has been paid for merely excavating stiff clay and filling it into wagons. It must be remembered that the interest of money on the cost of "navvy," the cost of wagons, rails, and other materials, that of lead, that of tipping, that of formation and soiling of bank, and slopes of cutting, and that of maintenance for twelve months, have all to be added to the cost of wagon filling. Clay cuttings, under a quarter of a mile lead, have been let at from 10½d. to 1s. per cubic yard to cover all these items; and the cost of 8¼d. seems to us high for wagon-filling alone.

Mr. Brand's experience of the steam navvy was in a cutting of about 50,000 cubic yards of stiff, hard, and tough clay, containing boulders weighing from a half-hundredweight to four tons. The machinery employed was the seventh made by the firm at Lincoln, and there were at first many breakages. These led to the replacement of the broken parts by stronger and better substitutes. Mr. Brand has obtained a higher daily duty than that recorded by Mr. Fox, the latter being 190 cubic yards per day, and the former 240 cubic yards. There is, however, a difference of more than twenty-five per cent. in the daily cost according to the two papers, and there is no allowance for depreciation made by Mr. Brand. If we take Mr. Fox's estimate of cost, as being given in more careful detail than the other, the cost of the wagon-filling at the station where Mr. Brand was at work (which is not named) would have been 6½d. per cubic yard instead of the 4¾d. which he estimates. Mr. Brand gives the cost of operating on the material by hand-labour at 1s. 6d. per cubic yard, exclusive of horses and tipping. Mr. Fox, from actual details, arrives at an estimate of 10¾d. for handwork. As the description of the soil excavated in each case is much in favour of the West Lancashire cutting, it is evident that comparison and revision of details are necessary before we can come to the question of saving in cost. Mr. Whitley's paper gives results of the working of his machine on the Castle Eden and Stockton Railway. He gives no prices, but obtained an average of 228 cubic yards per diem in Embleton cutting, of 305 cubic yards per diem in Grindon cutting, and a maximum daywork of 470 cubic yards on one occasion in the latter. The material was clay, with some boulders. Mr. Harrison neither gives prices nor describes materials. He filled, at the West Hartlepool docks, an average of 112·8 wagons per day by the steam navvy. The wagons had a capacity of three cubic yards, so that the solid stuff moved, allowing 2½ yards to be filled into each, would amount to 280 cubic yards per diem.

Taking an average of the above accounts, we find that the navvy has been good for about 248 cubic yards per diem. Looked at in a practical way, this would be equal to sixteen sets of six wagons each put out of a cutting. Taking the wagon-fillers at 4s. per diem each, twelve men, at a cost of 48s. ought to fill that quantity of stuff. The gullet men would not be more than half that number, say 27s. The number of wagons is so small that 8s. 4d. for a ganger, or rather as much of that price as can be fairly attributed to wagon-filling, is a high charge. We thus come to a little under 4*d*. for the excavation and filling of 248 yards by hand, and do not see, so far as the accounts go, any economical advantage in the use of the machine.

On the other hand, it is to be remembered that the machine is yet in its infancy, that the

cuttings undertaken appear to have been composed of material very ill suited for its action; and that any well-deserved labour-saving machine is an object of material value, as adding to the productive power of the country. In sand-cuttings we should anticipate that the steam-navvy would be capable of a very economical application. Less than 500 yards per diem it is hardly worth while for a contractor to take out of a cutting, and the machine ought readily to perform such a duty as that.

In its present state, the steam navvy consists of an iron truck, mounted on small flanged wheels; and, supporting a heavy boiler, engine, winding apparatus, and a powerful wrought-iron jib. From this is suspended by a beam, working at right angles to the jib, a sort of iron scuttle, which is scraped, by the action of the machine, up the face of the cutting, taking out a slice of the material, which is dropped into wagons by a horizontal movement of the jib. The advantages which are claimed by the makers, and which we think that the machine may be expected ultimately to offer, are these:—"It is suitable for any kind of material, from sand and gravel, to the toughest clays. It will excavate and deliver into wagons 500 to 600 cubic yards of stuff per day. It can be readily handled by two men and a boy. It effects a great saving in time, especially when the cost through strikes is taken into account. Finally, it can quickly be set to work in situations where it would be difficult to get the hand labour, and still more so to keep together a large body of men." It is here that the essential value of the machine lies. As giving command of labour, we can readily conceive that the invention may prove of great service to the engineer. As a means of saving money, neither of the professional gentlemen who have written on the subject has yet made out a clear case. It does not follow that a clear case is not to be made out by a report fully dealing with all the items of practical use, as to which, however, it is not matter of surprise that contractors should be reticent. It is not from estimates, but from bookkeeping, that the facts are to be collected; and contractors are not very willing to exhibit their books to their professional masters. Nor are they to be blamed for wishing to keep their own counsel.

THE KNOP AND FLOWER PATTERN IN INDIAN ART.

A SECOND edition has been issued of Dr. Birdwood's "Handbook to the British Indian Section," Paris Universal Exhibition, and we are not at all surprised at the demand which has led to it. It is an exceedingly interesting little volume, and a capital shilling's worth, as well for those at home and for those in the Exhibition building.* We wish some of the other sections had found a Birdwood. We extract the chapter on the Knop and Flower pattern:—

We have traced the gradual development of Aryan civilisation, from the Punjab and Valley of Cashmere westward to the British Isles, and the rise of Semitic civilisation in the lands which the to-and-fro trade of Europe and Asia had to cross about half-way down the *litus Arianum*, in consequence of the interposed obstruction of the Isthmus of Suez and Africa, and the peninsula of Arabia. We have seen how this line of coast and overland intercommunication between the East and West Aryans was subject to be constantly interrupted by the incursions of Scyths, Mongols, and other Turkish hordes, whom we may associate with "the Shut up nations" of the Alexander legends; and how it still went on, even after the Ottoman Turks had established their dominion between the Tigris and Euphrates, the Nile, and the Danube, and was only discarded on the discovery of the ocean way round Africa to the East. This is but 400 years ago, and for 4,000 years before the road between India and the Mediterranean countries had been through the Tigris and Euphrates valley, and the valley of the Nile. From the time of Alexander, and through all the time of the Ptolemies and Seleucidæ, and under the Roman Empire, until Egypt, Syria, and Persia were conquered by the Saracens, the intercourse between India and Greece through Persia, Assyria, Syria, and Egypt was unbroken and intimate. Although interrupted at first, it again revived under the Saracens, and, under the Ottoman Turks, was only finally suspended after the Portuguese had obtained possession of Ormuz. Even then, the Armenians continued, as they have to the present day, the local intercourse between India and Assyria and Western Asia; going to India and purchasing goods on the spot, and returning with them to Bandar Abbas, Ispahan, Baghdad, Mosul, and Tabriz.

This is quite sufficient to account for the remarkable affinity between Assyrian and Indian decorative art, and the frequent identity of their ornamental details; which, in turn, prove the continuity and intimacy of the commercial intercourse between India and Assyria. Of course, the general affinity between Indian and Assyrian art may be in part due to the common Turanian substratum of Indian and Assyrian civilisation. When the Aryas made their way through Cashmere into the Punjab, they found the plains of the Upper Indus already occupied by a Turanian race, which they indeed easily conquered, but which, as the caste regulations of the Code of Menu prove, was far superior to themselves in industrial civilisation. These aborigines already worked in metal and stone, and wove woollen, cotton, and linen stuffs, knew how to dye them, and to embellish their buildings with paintings: the descriptions of Megasthenes prove that, even at its highest development, Hindu civilisation was more Turanian than Aryan; and the pre-Aryan Turanian civilisation of India must have been similar to the pre-Semitic Turanian civilisation of Babylonia, Chaldæa, and Assyria, and probably preceded it. All that is monstrous in the decorative forms of Indian and Assyrian art, all that is obscene in Indian symbolism, is probably derived from common Turanian sources, anterior to direct commercial intercourse between India and Assyria. But, when we find highly artificial and complicated Indian decorative designs identical in form and detail with Assyrian, we feel sure that the one must have been copied from the other, and indeed there can be no doubt that the Indian ornamental designs, applied to and derived directly from sculpture, which are identical with Assyrian, were copied from the monuments of Assyria; Egyptian, of course, from Egypt. We cannot trust alone to the allusions, references, or even descriptions of the Bible, Homer, and the Ramayana, to identify the art manufactures of India with those of Assyria, Phœnicia, and Egypt; by themselves they indicate generic likeness only; and their specific identity can only be demonstrated by a comparison of the actual remains of ancient art, and of the carved and painted representations on contemporary monuments. But when this identity has been proved from the monuments and other remains, the Bible, Homer, the Ramayana and Mahabharata, and Pliny, are invaluable in that they enable us to complete our information on the sure and certain foundation so laid; and, to the picture thus composed of the early civilisation of the world, we are justified in giving colour and motion from the strictly traditional, still living civilisation of India, while it is reasonable to suppose that the Indian was the earliest of those primitive civilisations.

The Bible, and Homer, and the Greek poets generally, are full of idyllic scenes from the life of ancient Greece, Syria, and Egypt, which are still the commonplaces of the daily life of the natives of India, who have lived apart from the corruptions of European civilisation. There are many passages also directly illustrating the handicraft of the ancients. In Proverbs xxxi. we read the praise attributed to Solomon, about B.C. 1015-975, of a good wife: "She seeketh wool and flax, and worketh willingly with her hands. She is like the merchants' ships, she bringeth her food from afar. She riseth also while it is yet night, and giveth meat [bread] to her household. . . . . She considereth a field, and buyeth it; with the fruit of her hands she planteth a vineyard. . . . . She perceiveth that her merchandise is good: her candle goeth not out by night. She layeth her hands to the spindle, and her hands hold the distaff. . . . . She is not afraid of the snow for her household; for all her household are clothed with scarlet. She maketh herself coverings of tapestry: her clothing is silk and purple. Her husband is known in the gates, when he sitteth among the elders of the land. She maketh fine linen and selleth it; and delivereth girdles unto the merchant. Strength and honour are her clothing; and she shall rejoice in time to come. . . . . Her children arise up, and call her blessed; her husband also, and he praiseth her. . . . . Favour is deceitful, and beauty is vain; but a woman that feareth the Lord, she shall be praised. Give her of the fruit of her hands, and let her own works praise her in the gates." And in Exodus xxxv. 30-35, about B.C. 1500, we read of Bezaleel and Aholiab the master craftsman of the first Temple:—"And Moses said unto the children of Israel, See, the Lord hath called by name Bezaleel, the son of Uri, the son of Hur, of the tribe of Judah; and He hath filled him with the spirit of God, in wisdom, in understanding, and knowledge, and in all manner of workmanship; and to devise curious works, to work in gold, and in silver, and in brass, and in the cutting of stones to set them [jewelry], and in carving of wood, to make any manner of cunning work. And He hath put in his heart that he may teach, both he and Aholiab, the son of Ahisamach, of the tribe of Dan. Them hath he filled with wisdom of heart, to work all manner of work, of the engraver, and of the cunning workman, and of the embroiderer, in blue, and in purple, and in scarlet, and in fine linen, and of the weaver, even of them that do any work, and of those that devise cunning work." These passages, and there are numbers of the same description in Homer and Aristophanes, are sufficient to prove the close affinity of the primitive Hindu civilisation of India, in the simplicity and beauty of its life, in the profound religiousness of its animating spirit, and in the identity of many of its industrial arts, with the civilisations of Assyria, Phœnicia, and Egypt, and with that of Greece in the heroic age at least; while even in the midst of the growing corruptions of imperial Rome, we find that Augustus Cæsar brought up the females of his family and household on the antique model, and wore no clothing but such as had been made by their hands.

The researches of Mr. Fergusson have shown that stone architecture in India does not begin before the end of the third century B.C. He has also drawn attention to the similarity in ground plan, and, in some instances in elevation, of Indian temples to Assyrian and Egyptian. He observes that if the description given by Josephus of the Temple at Jerusalem, as rebuilt by Herod, be read with a plan such as that of Tinnevelly, it is impossible to escape the conviction that these coincidences are not wholly accidental. In their grandeur and splendour of detail, and in the labour bestowed on them for labour's sake, the resemblance between the temples of Egypt and Madras is most remarkable. Not less startling are the traces of Assyrian art in these temples, and Mr. Fergusson expresses the opinion that, if we are to trust to tradition or to mythology or to ethnological coincidences, it is rather to the valley of the Tigris and Euphrates than to the banks of the Nile that we should look for the *incunabula* of what are found in Southern India. The jewelry of Madras is distinctly founded on its temple ornaments. A Madras silver incense-stick holder, exhibited by Mr. FitzGerald, formed of an antelope hunted by a dog along a conventional flower-stalk, and taken from the sculptures common on all Madras temples, is identical with some of the representations of hunting scenes on the Assyrian monuments given in Rawlinson's "Ancient Monarchies." In this it is clear that India is the copyist. The knop and flower, or cone and flower, pattern is represented, with local variations, on early Indian monuments in the same form and general style as on the marbles of Assyria; and in the Bharhut sculptures, at least, the lotus is repeatedly represented in the identical half-conventional form in which we find it, *en silhouette*, in the hieroglyphic paintings of Egypt. Here, again, India is obviously the copyist.

It is quite possible, however, that some of the very forms in India which can be proved to be copied from Assyrian temples and palaces may have originally been carried into Egypt and Assyria on Indian cotton or woollen fabrics and on jewelry. The knop-and-flower pattern commonly found on Scinde pottery is identical with the knop-and-flower pattern on the Koyunjik palace doorway figured in Rawlinson's "Ancient Monarchies," vol. i., p. 417. In the same volume, at p. 493, is a circular breast ornament, on a royal robe, from a sculpture at Nimrud. Here the cone does not alternate with a lotus-flower, but with the fan-like head of the *Hom*. Nor is the cone a lotus-bud, but a larger representation of the fruit of the *Hom*. In a common form of Persian plate, which may (chiefly because of the circular shape of the two objects) be compared with this breast ornament, the cone is developed into a form conical in shape, but *Hom*-like in

* London: Offices of the Royal Commission, Canada-buildings, King-street, Westminster.

etail, and the flower is metamorphosed into a strange Chinese style of scroll. That it is the knop-and-flower pattern is proved beyond dispute by the curved line which unites the base of the knop with the base of the flower, and which is found surviving in ornaments derived from this pattern when almost every other trace of it has disappeared. A modification, in point, of this pattern is repeated on the inner border of the plate. A very beautiful variation of the pattern is one of the commonest seen on Scinde tiles, in which the knop has become the regular Saracenic cone, and the flower not the head of the *Hom*, or lotus, but a full-blown Iris. On Delhi and Cashmere shawl-borders the *Hom*-head-like flower often looks very like the "Shell" in Renaissance. On these shawl-borders the knop and flower are often also combined, the knop becoming the cone or cypress-like trunk of a tree, the branches of which fan out like the fronds of the *Hom*. In some Indian and Persian carpets the knop or cone throws out graceful *Hom* fronds, one on each side, from the ends of which hangs a large flower, presenting the alternation of a branching cone and flower. Every other branching cone is also, as it were, upside down, so that we get a winding floriated line running in and out between each cone and flower. When the cone is large it is filled in with floral detail, as in Cashmere shawls, the last bright inflorescence of the original hard Egyptian and Assyrian knop-and-flower pattern. A few engravings are added from Owen Jones's "Grammar of Ornament," to show the modification of this pattern in Egyptian, Greek, Italian, and Renaissance art. Chapters have been written by puzzle-headed *savans* to account for these scrolls and for the cone, but surely their origin is so plain that he who runs may read. The Greek "honeysuckle and palmette" scroll is simply the knop and flower, as are the Renaissance "shell," and the "tongue-and-dart," and "egg-and-tongue," patterns in classical mouldings. Long ago Mr. Fergusson pointed out [illustrated "Handbook of Architecture," vol. i., p. 7] that in the "*lat*" at Allahabad the necking immediately below the capital represents with considerable purity the honeysuckle ornament of the Assyrians, which the Greeks borrowed from them with the Ionic order. Its form is derived originally from the date, *Hom*, but it really represents, conventionally, a flowering lotus, as the Bharhut sculptures enable us to determine. The "reel-and-bead" pattern running along the lower border of the necking represent the lotus stalks. One Chinese modification of the knop-and-flower pattern is very significant. The flower is here a pomegranate, and the cones have become green pomegranate-buds; but, instead of being in their original Assyrian places, they are attached to the edge of the vermilion corolla, one on each side, while their old places are filled by a panel formed by the curved lines, which should have joined the flower to the bud, running down between the flowers in parallel lines to the lower edge of the patterned border.

The Assyrian breast ornament figured by Canon Rawlinson proves that the fan-like pattern throwing off its long-stalked cones, arranged alternately round the border with the larger cones, is the head of the *Hom*, represented in the centre, and a multitude of representations of the *Hom* in Rawlinson's "Ancient Monarchies" and "Herodotus," and on old Saracenic and Sicilian brocades, prove that it is the date-tree, and that the long-stalked cones flourished out from it, and the large cones which alternate with it round the border of this breast ornament, are great clusters of dates, highly conventionalised. These cones are sometimes replaced by pomegranates, and, strange to say, the Tree of Life represented on modern Yarkand rugs is always a pomegranate-tree. The cone figured by Canon Rawlinson, vol. ii., p. 212, as a pine-apple, is clearly a bunch of dates bursting from its spathe. This cone appears on late Italian and Early Renaissance brocades, crowned, with flames rising from the crown, and alternating with oak leaves, from which long-stalked acorns are represented issuing forth like the cones from the trunk and head of the date *Hom*.

The original *Hom* was the Sanskrit *Soma*, *Sarcostemma brevistigma*, a leafless (the rudimentary leaves are scarcely visible) scandent Asclepiad, with its flowers collected in umbels, fan-like *en silhouette*, a native of the southern slopes of the Cashmere valley and Hindu Kush, the fermented juice of which was the first intoxicant of the Aryan race. It is still used as an intoxicant by the Brahmins, and the succulent stalks are chewed by weary wayfarers to allay their thirst. It is admirably represented on the Assyrian sculptures; and in Rawlinson's "Ancient Monarchies," vol. ii., p. 236, it is figured, twined very characteristically although highly conventionally, about the date-tree, forming the "Tree of Life," *Asherah*, or "Grove," sacred to Asshur, the Supreme Deity of the Assyrians, the Lord and Giver of Life. Canon Rawlinson notices the resemblance of the *Hom* head to the Greek honeysuckle ornament, and adds, "I suspect that the so-called 'flower' [*i.e.*, honeysuckle] was in reality a representation of the head of a palm-tree." Probably the date was substituted for the original *Hom* in Assyria, in consequence of the Aryas finding that they could not naturalise the true *Hom* plant, or because the date yields a more abundant intoxicating juice. Its fruit, also, would become the staff of life in the region of the Euphrates valley, and hence would naturally be consecrated to Asshur as the "Tree of Life." Later, the vine took its place in Asia Minor and Greece. As the "Tree of Life" is associated in the Bible with the Serpent and the Tree of Knowledge of Good and Evil, which brought death into the world, so it is very suggestive to see in Rawlinson, vol. ii., p. 167, the date *Hom* arranged alternately with a serpent-encircled cypress in the scene in which an Assyrian king is feasting his queen in a bower (*gloriette*) of the royal gardens.

In Egypt the knop and flower were represented by the date-palm and its fruit, by the lotus and its bud, and by the lotus-flower and a bunch of grapes, or the lotus-flower and a bull's-head; sometimes the flower by the papyrus-head. In Owen Jones's "Grammar of Ornament," plate 4, fig. 6, the ornament, which looks like a lotus-headed form of some sort, is proved to be a date, by the rippled mass of red and green hanging down one side of it, representing the ripe fructification of the date burst from its spathe. That the ripple is taken from the zig-zag of the branching date-stalks, any botanist will see. On the monuments, the Phœnician Venus Chiun [Amos v. 26] is shown, presenting snakes to Remphan or Moloch, the Author of Death, and lotus-flowers to Khem, the Author of Life, on whose altar we find the Tree of Life represented by a loto-papyro-palm-headed plant form, with a cypress form, evidently derived from the lotus-bud, on either side, and guarded by the *cabiri*, which suggested to the Hebrews the Cherubim, placed at the east of the Garden of Eden, to keep the way of the Tree of Life, and to the Greeks, "the dog" Cerberus, that guarded the entrance to Hades. The Tree of Life is represented throughout Greek and Roman and Italian and Renaissance art. It is still represented on the commonest Spanish and Portuguese earthenware by a green tree that looks exactly like a Noah's ark tree; but it invariably springs from two curved horns, which betray the secret. In India the knop and flower change like the transformations of a dream. Indeed, in Hindu art imagination is let loose as in a dream. In the Amravati and Bharhut sculptures the transformations go on under your eye, and reveal the whole mystery. The cone is generally the lotus-bud, and the elephant is never represented in carved stone without it in its trunk. Sometimes the cone of budding plantain-fruit takes its place. The flower is generally the lotus represented *en silhouette*, like a fan, or full-faced; and sometimes the fan-like form of the date *Hom* is given to the peacock's tail, as to the many-headed cobra; and not only these cobra-heads, but the water-lily is represented in true honeysuckle form. The cone is also represented by the mango and jack. In short, anything full of the glory of life becomes the symbol of life. The peacock's tail, the glorious lotus-flower, the mighty jack, the nutritious and uncloying plantain, the luscious, golden mango, the thyrsus-like clusters of the flowers of the *cadumba*, and the sacred fig, throwing down rootlets from every branch, which take root again and spring up in forests round the parent stem; all are natural and obvious symbols of life. The melon-shaped finial on the pagodas of Indian temples is probably derived from the unripe fruit of *Nymphæa rubra*. We have, however, to be on our watch for the vagaries of Hindu imagination. The entire leaf of the jack, *Artocarpus integrifolia*, is represented so swollen and bursting with life as to pass into the divided leaf of the bread-fruit tree, *Artocarpus incisa*. Again, we find the catkins of the jack, from which the long pendent ornaments worn by elephants in front of their ears are modelled, represented hanging out of the flowers, from the fruit of the lotus, from the branches of the sacred fig, and about the *lingam*, and *trisul*, which I believe to be the combined *lingam* and *yoni*. In the earlier sculptures a lotus plant is represented issuing from the proboscis of an elephant, the stalk running along in an undulating line, between the curves of which the flower is seen alternately in full face and *en silhouette*, in the most superb style of conventional art. In the Bharhut sculptures a lotus springs in the same way from an elephant, and its flowers alternate with the jack and mango; and, between each lotus "flower," and whatever fruit takes the place of the "knop" or cone, we have representations of the Buddhistic fables or *jatakas*; while the fruitful mystic lotus is represented pouring down all manner of good things, and jewelry in countless forms. In one place a woman from a tree, reminding one of the woman in the Egyptian Tree of Life, is pouring water into a man's hands, from a veritable teapot. In the Amravati and Takht-i-bhai sculptures, the lotus-stalk is looped up in festoons by dwarfs, as we see similar festoons, in Roman architectural remains, held up by genii. It may be that the Takht-i-bhai sculptures were influenced by Greek examples, or were executed under Greek direction; but really the intercourse with Assyria will account for a good deal that looks like Greek inspiration in India, just as it is now evident that the ornamental details of Greek sculpture also were derived from Assyria. The "knotted rope" pattern may have been taken from the knots in the stalks of the cone issuing from the stem and head of the date *Hom*, and the wedge pattern, alternate dark and light, from the conventional representation of the leaf scars on the stem of the date *Hom*. The tree-like figures given in plate 2, compiled from Owen Jones, and Mr. Fergusson, and Mrs. Jameson, all recall the *Asherah* or "Grove" of the Assyrians, particularly the Mediæval representation of the Cross, as the tree with twelve leaves for the healing of the nations.

Sometimes on Persian rugs the entire tree is represented, but generally it would be past all recognition but for smaller representations of it within the larger. In Yarkand carpets, however, it is seen filling the whole centre of the carpet, stark and stiff, as if cut out in metal. In Persian art, and in Indian art derived from Persian, the tree becomes a beautiful flowering plant, or simple sprig of flowers; but in Hindu art it remains in its hard architectural form, as seen in temple lamps, and the models in brass and copper of the Sacred Fig as the Tree of Life. On an embroidered Pindari bag it is represented in two forms, one like a notched Noah's Ark tree, and the other branched like the Temple candelabra. In this bag the cone is represented with the trees.

Neither is it difficult to conjecture how these religious symbols of the first worship of the Aryan race, afterwards darkened and polluted in Turanian India, and Egypt, and Assyria, by a monstrous and obscene symbolism, came to be universally adopted in the art ornament of the East. It originated in the embroidered hangings and veils worked by women for the temples, which they embroidered with the representation of the symbol of the deity worshipped.

The women "who wove hangings for the grove," or *Asherah*, are alluded to in 2 Kings xxiii. 7. They probably embroidered on cut patterns, and worked the larger patterns in *appliqué* into their work; and they cut the patterns by folding the cloth double, so as by one undulating or zigzag cut to get a two-sided symmetrical pattern. Nor is this entirely conjecture. This method is everywhere practised among the artistic peasantry of Europe. I have a number of such patterns, which I once saw a French peasant boy cutting out in paper, to while away the time. It happens that they are all of trees, some cypresses, and others trees with the cross introduced in the most strange conventional manner about them,—trees, in fact, of life and death. The method of cutting out patterns in this way tends to perpetuate a symmetrical and rectangular representation of ornament. The Noah's Ark-like trees, on the Pindari bag, is certainly derived from a bit of paper or cloth folded and cut crossways, and then notched. Be this as it may, the knop-and-flower pattern, and the Tree of Life pattern, pervade all decorative art, and by direct derivation from the Assyrian lotus and lotus bud, and *Asherah* and cone, but no longer symbols. This absence of

symbolism is the weakness of modern European decoration, as, indeed, it was of Grecian; and yet what conventional form is more beautiful than the French *fleur-de-lis*, more beautiful and worhipful than the Tudor rose, or than such heraldic symbols as the cross crosslet; and the most natural decoration for wall-papers, curtains, and book-lining papers, would be, for people who could afford it, to use family arms, alone or in combination with national symbols, and conventionalised representations of national flowers or animals. But no symbols can approach in beauty of form and meaning to the knop and flower, and the *Hom* of Assyria, and, purified of all local taint of Asshur, Ashtoreth, or Astarte, they belong to all the Aryan races in the Old World and the New.

The history of mankind is in its direct impulses the history of surplus populations in search of food; but wherever men have been able to rest, and to found civil and political organisations, they have raised up testimony to the truth that man shall not live by bread alone. We find it figured everywhere in Oriental art, and we cannot take up a talisman of Egypt, an engraved gem of Assyria, a Syrian silk, an alabastron of Persian perfumes, or a Persian illuminated MS. or carpet, a Cashmere shawl, an Indian jewel or *kincob*, any of the great store of these splendid and precious stuffs, and arms, and vessels of wrought gold and silver, presented to the Prince of Wales, on which we do not find the acknowledgment of the Divine author and finisher of every perfect work; in symbols taken from the most majestic of trees and the loveliest and most graceful of flowers, and which express more simply, directly, and fully than can any form of words, the wisdom and beneficence of the Creator, and the gladness and praise of men. The Portuguese, the first discoverers of India, always carried the Cross at the mast-head of their ships, as a sign of the higher aims of their enterprise, and of all human intercourse and effort. They erred grievously in seeking to give too dogmatic an effect to their aspirations, and the Inquisition of Goa is the blackest spot in the history of the connexion of Europe with the East. But not the less valuable is the recognition of the true position and destiny of men in the world,—that only in responsibilities incurred, and duties discharged by each for another, is there any hope either for individuals or for States, and that to weary of and shrink from them are the first signs of the sinking fortunes of an empire.

INSTRUCTION IN MUSIC FOR THE BLIND.

WE have been requested to make known the invention, by an Italian, of a method for teaching the blind to read music, and to acquire the rules of harmony and counterpoint, without the assistance of teachers who teach only by the ear. In Italy it is reckoned that there exist 35,000 blind persons, many of whom could gain a competency by playing in orchestras, &c., were they capable of studying thoroughly the theory of music, independently of the scant teaching in asylums. For example, in the Milan Asylum, one master alone is provided for the instruction of music, thus rendering those whose natural talents might be developed for usefulness and gain dependent entirely for teaching on the verbal instruction of one individual. Counterpoint is impossible to be taught, except by harmony and the correct ear. The problem to be solved is, how to provide the blind with a plentiful supply of music, printed in a way easily legible to them, and this also at the lowest possible price, so that they may have the means of studying harmony and counterpoint without the aid of the voice or the plastic example of individuals enjoying the power of sight. Does there exist a musical notation for the blind which will supply the requirements of the art?

Italy, since 1866, in imitation of the French institutions, has introduced for the blind the so-called system of the priest Braille. In Paris the musical notation according to Braille has been, and still is, regarded as a temporary expedient—a *pis aller provisoire*. It has failed in accomplishing the end aimed at. The illustrious Pennisi Calanna, born blind, mentioned among the most celebrated blind persons in the account published in Vienna on the subject, and who this year has caused so much wonder at Geneva by the different displays of learning exhibited by him in mathematics, music, literature, criticism, &c.,—and who, in February, 1878, lectured in the Athenæum of Geneva on the difficult question of the influence of the Papacy in times past on literature,—this Pennisi Calanna pronounced against the Braille system:—1. Because by it the rhythmical expression can never be rendered exact. 2. The notation of the chords presents indescribable difficulties. 3. The over-multiplicity of signs generates confusion. 4. The impossibility of arranging the accord of the different parts. 5. Counterpoint becomes impossible. 6. The impracticability of correcting what has been already written without rewriting the whole page. 7. The composer cannot re-read what has been already written, and continue his writing—hence, cannot avoid the thousand errors of harmony of parts which may be made by the most experienced in their first copies. 8. With the Braille system, writing orchestral parts must be renounced, because the machine does not allow the requirements of going from line to line to provide for the separate exigencies of the different instruments. 9. That the Braille system is only to be adopted by those who are already acquainted with music.

All systems introduced from Germany, France, Russia, and America have failed in teaching the blind to study by themselves the theory of music. It has fallen to the lot of an aged Italian professor, after a study of nearly twenty years, to solve the difficult problem. Professor Emanuele Gambale, of Naples, now a resident of Florence, pronounces the theory of his system to be the simplest ever invented in point of extreme clearness in pointing out the notes, mathematical precision in fixing their value, impossibility of doubt either in representing the different parts, or in the embellishments. The printing for the use of the blind having become so easy, clear, inexpensive, and expeditious, they can quickly have a rich collection of music either for solo or part playing; and adopting the system of Gambale, the most difficult and complicated compositions of Beethoven, Bach, Listz, &c., seem easily executed at first sight, so to speak. Still more, with this system, a blind person can study counterpoint through the perception of sounds and their connexion of place and rhythm, and so on till he is able to direct an orchestra. The system has been approved of by Lauro Rossi, director of the Conservatore of Milan, and others, before whom some youths, instructed to the method by Prof. Gambale during less than two months, were able to read off and play on the pianoforte a composition written on the spot by Lauro Rossi, by means of the signs in relief invented by Professor Gambale, executing also scales and exercises prepared in the same manner.

Promises were made for its adoption in all the institutions existing, but the want of means has caused the old system to be continued, and the unfortunate blind to be deprived of a real help and endless resource both of occupation and gain. Professor Gambale is now nearly eighty years of age, but possesses great energy and powers of intellect. His most earnest desire is to see his invention used for the amelioration of the condition of the poor blind, and failing to see it adopted by his own countrymen—not from its inutility, but from the paucity of his country's finances,—he desires to make it known to others.

OBITUARY.

Mr. G. P. Bidder, C.E., F.R.S.—Mr. George Parker Bidder, the well-known Civil Engineer, died on the 20th inst., at his residence, Ravensbury, Dartmouth, whither he had lately retired from professional pursuits. He was born about the year 1806, at Moretonhampstead, in Devonshire, where his father was a mason. At an early age he attracted much attention by his talent for mental calculation, which earned for him the cognomen of "the calculating boy," and led to his appearance at Court ("when George III. was king") at an unusually early age. Unlike some other youthful prodigies, he did not fail to maintain a reputation for ability in his after-life. The kindness of a friend enabled him to acquire a solid education at the University of Edinburgh, where he formed an acquaintance with the late Robert Stephenson, which influenced the whole of his subsequent career. After a short engagement at an insurance office, distasteful to himself, he was employed for a time upon the Ordnance Survey. The experience which he acquired here enabled him to fill the post of assistant engineer to Mr. Henry Robertson Palmer, who was then engaged in the construction of the Eastern Dock at the London Docks. Mr. Bidder's next engagement was with Messrs. Walker & Burgess, in superintending the construction of the Brunswick Wharf at Blackwall—noteworthy for the first use of cast-iron piles in river-walls. When Robert Stephenson, about 1831, planned the London and Birmingham Railway (now forming part of the London and North-Western system), Mr. Bidder joined him as assistant; and during a long series of years he took part in many works on which the two Stephensons were engaged. He played an active part in the obstinate Parliamentary contests concerning atmospheric railways and the "battle of thegauges." Mr. Bidder was afterwards sole engineer of several important works. At an early period in the introduction of the electric telegraph system he recognised its importance in connexion with railways, especially in working single lines; and he introduced it on the Blackwall and the Norwich and Yarmouth lines. He was one of the founders of the original Electric Telegraph Company, and was a constant adviser to the Board down to the transfer in 1870 of the company's wires and rights to the Government,—a transfer which he assisted in completing. Mr. Bidder became a member of the Institution of Civil Engineers in 1825, and was one of the oldest of the body in that capacity. He was for many years a member of the council, and was president in 1860 and 1861. A paper published in the fifteenth volume of the "Minutes of Proceedings" of the Institution of Civil Engineers, gives a curious account of his powers in mental calculation. This paper was the result of two oral lectures given by him at the Institution, under the presidency of Mr. Robert Stephenson.

THE STORY WITH SOME INTEREST IN ST. LUKE'S.

IT will be remembered that the Metropolitan Board of Works, at their meeting of July 26 last, adopted the following resolution, which had been drawn up by a sub-committee appointed by the Board to consider the position of Mr. Storey, a member of the Vestry of St. Luke, and chairman of the Improvement and Parliamentary Committee of the Vestry, with regard to certain property required for the Whitecross-street and Golden-lane improvement scheme:—

"That from the facts and circumstances which have come to the knowledge of the committee, relative to the past and present interested connexion of Mr. Joseph Storey, the representative to this Board of the parish of St. Luke, with property in that parish required for the Board's improvement scheme in Whitecross-street, under the Artisans' Dwellings Act, and for the local improvement in Golden-lane, now being carried out by the same Vestry, and to the cost of which the Board hove agreed to contribute a moiety, and from the fact that a claim is now before the committee, signed by Mr. Storey and his co-adventurers, demanding a sum of no less than 47,062*l.* in respect of property in which he is largely interested, the committee are of opinion that Mr. Storey's duties as a member of the Metropolitan Board of Works, are in complete conflict with the private interests of himself and of his co-adventurers, and that his conduct in relation to the properties in question is calculated to reflect discredit upon local self-government."

On Tuesday last an adjourned meeting of members of St. Luke's Vestry was held, and the following resolution was submitted to the Vestry:—

"That this meeting, considering the memorial presented from the Banner-street meeting, and the memorial which was forwarded to the Metropolitan Board of Works [this latter was by the Vestry, approving of what their representative had done] on the 26th of July last, recommends the retirement of Mr. Storey from the membership of the Metropolitan Board of Works."

To this resolution the following amendment was laid before the Vestry:—

"That this Vestry having considered the memorial presented to them at their last meeting and the oral representations of some of the memorialists then made and the charges brought forward, and also the explanation of Mr. Storey in relation thereto, are of opinion that the charges have been made for personal objects only, and that the transactions of Mr. Storey in the purchase and sale of property in this parish have all been fair and legitimate, as a buyer and seller of property carried on by him for many years past, and long prior to his becoming a vestryman or a member of the Metropolitan Board of Works; and this Vestry considering that he has done no act deserving censure, or which can cast the slightest slur on his honour or integrity, or renders his retirement from the Vestry or the Metropolitan Board of Works necessary, expedient, or desirable, they beg to express their full confidence in and hereby offer him their thanks for the very able manner in which, as chairman of the Improvement Committee, he has fulfilled the duties of that arduous office."

The amendment was carried by 20 to 12.

SANITARY INSTITUTE OF GREAT BRITAIN.

THE Congress of this Institute is to be held at Stafford, and will occupy from October 2nd to October 5th inclusive. A list of promised papers is published, and we have no doubt a certain amount of good will be done. We must confess, however, we have no warm words of welcome for the society. It is an endeavour to supersede the Health Department of the Social Science Association, and by holding the meetings two or three weeks before the time fixed for the Social Science Congress in Cheltenham, the shine to a certain extent is naturally taken off the latter. As to the Exhibition of Sanitary Appliances announced by the Institute, it is a downright pillage of an idea carefully worked out and brought into action at all the recent Congresses of the Social Science Association, mainly by Mr. James Robinson, and a small committee who sought sedulously to prevent the dominance of the trade element, and to make it subserve to the utmost the public good. One result of the plagiarism will probably be the absence of a Sanitary Exhibition at Cheltenham. We notice, with some surprise we must confess, the names of several long attached and much esteemed members of the Social Science Association in the programme of the Sanitary Institute, such as Mr. Chadwick, Mr. R. Rawlinson, Captain Galton, and a few others, so that possibly our views are wrong,—we hold them, nevertheless.

SURVEYORSHIP ITEMS.

Bournemouth.—Mr. G. R. Andrews, late clerk of the works to the Bournemouth Commissioners, has been appointed surveyor to that body, at a salary of 200*l.* per annum.

Epsom.—Mr. S. M. Pratt has been appointed assistant surveyor to the Epsom Highway Board, at a salary of 100*l.* His father, Mr. Sampson Pratt, holds the position of surveyor to the Board.

Barton-upon-Irwell.—On the 18th inst. Mr. J. Price, C.E., resident engineer on the Barrow-in-Furness main drainage works, was elected to the post of surveyor to the Barton-upon-Irwell Rural Sanitary Authority, at a salary of 275*l.* a year. There were seventy-eight candidates.

THE ENCLOSURE OF CLERKENWELL-GREEN.

THE Clerkenwell Vestry having, at their meeting on the 19th inst., finally resolved upon enclosing the open space in Clerkenwell, notwithstanding the opposition of the several bodies who are in the habit of holding meetings there, a notice of the manner in which the ground is to be laid out—as shown by the plans prepared by Mr. Cox, the surveyor to the Vestry,—may be interesting. The area of that portion proposed to be enclosed is 200 ft. in length, and 40 ft. in width at the west end immediately in front of the Middlesex Sessions House, narrowing in width at the east end, where it is only 20 ft. in width, the entire enclosed ground occupying an area of about 6,000 ft. At the west end there will be iron gates, leading on to an asphalted roadway, 20 ft. in width, which extends to about half the length of the enclosure. At this point, in the centre, an ornamental fountain will be erected, on each side of which the asphalted road, continued to the right and also to the left, gives egress from the enclosure through gates on either side. Each side of the asphalte road will be fitted with seats, while the space beyond, on the north and south sides respectively, extending to the boundary of the enclosure, will be turfed, and planted with shrubs and flowers. That portion on the east side of the fountain will be principally turfed and planted with shrubs and flowers, outside of which will be footpaths leading to a drinking-fountain at the north-east corner. The whole will be enclosed by ornamental iron railings, surmounted by globular lamps all round. The space as enclosed will leave a carriage-way on the west side, in front of the Sessions House, and also on the north and south sides, of from 30 ft. to 35 ft. in width, in addition to 12 ft. of footpath. The gates will be closed in the evening in accordance with the system adopted in many other enclosed spaces in the metropolis.

CHURCH RESTORATION AND EXTENSION IN THE SOUTH YORKSHIRE MINING DISTRICTS.

THE numerous new and extensive collieries which are being opened out and developed in the South Yorkshire mining districts have rendered it imperative upon the owners of landed estates and those who have the spiritual welfare of the people in their hands to either greatly enlarge existing churches or erect new ones. Most of the new collieries are laid out on a scale capable of producing 1,000 tons of coal per working-day, and giving employment to from 500 to 800 men. As a rule, the coal is being sunk to in hitherto unexplored parts of the coalfield where the population has for years been stationary. Most of the owners of these vast undertakings have been compelled to erect houses for their workmen, so that in several parts of the district entire new villages are springing into existence where only agricultural pursuits have been followed for generations. At Carlton, near Barnsley, where the Yorkshire and Derbyshire Coal and Iron Company have sunk a large colliery on the estate of the Earl of Wharncliffe, a new church is being erected at the sole expense of his lordship. At Monk Bretton, where of late years a vast colliery undertaking has been developed by the Monk Bretton Colliery Company, the church has been recently entirely rebuilt. The most striking instance of the rapid changes referred to is to be found at South Kirkby,—a quiet, rural, agricultural village about seven miles north-east by east of Barnsley, and about equal distances from Pontefract and Doncaster. The village in 1838 consisted of 615 inhabitants, and these have since not been materially increased. A rapid change will, however, soon come over the entire district, owing to the south Kirkby Colliery Company having secured the whole of the coal belonging to Mr. Allott, the lord of the manor, and, having sunk two of the deepest shafts in Yorkshire to the coal, which has been met with in one shaft at a depth of 630 yards from the surface. As the company will give employment to more people than exist in the village, even where they are all miners, they have erected a number of houses, which will shortly be very greatly increased, and in all probability the population will shortly be more than doubled. Under these circumstances, the vicar, and those acting in concert with him, have very creditably resolved to partly restore the village church, and greatly increase the accommodation for worshippers. The structure, which is dedicated to All Saints, was erected in the early part of the fourteenth century, and is a very neat specimen of the style of architecture which flourished at that period. It has a large tower and six bells, and everywhere bears traces of good workmanship. The exterior, it may be stated, is in a state of decay, and requires immediate attention, but the amount of funds forthcoming will not allow of this being given at present, though it is to be hoped this defect will be remedied. The carrying out of the work of restoration has been intrusted to a firm of London architects, and under their care the restoration is rapidly progressing. The work, which is for the most part confined to the interior, will be defrayed by subscription and a grant from the York Diocesan Society. The whole of the old wood flooring, which caused great dampness, has been removed, and a layer of concrete has been placed under the flooring, which is composed of wood, with tiled passages. The old-fashioned square pews, which were nearly 6 ft. in height, have been swept away, and open seats substituted. The old gallery at the west end, which disfigured the interior, has been entirely removed. The tower-arch has been opened out, thus affording a full view of the western window in the tower. The chancel has been restored and rendered much more commodious. The stonework generally has been scraped down, care being taken to preserve and retain the original characteristics of the building. It has been found necessary to remove the old lead roof of the nave, the replacing of which has been carried out by Messrs. Taskers, plumbers, of South Kirkby. Owing to the level of the ground being higher than the flooring, the architects have constructed a trench round the outer walls of the church, as a preventive against damp disfiguring the internal walls, which up to the present time has been the case. The contractor is Mr. W. Anelay, of Doncaster. It may be stated that in the west porch of the church there is a small piece of thirteenth-century work; whilst in the south porch a very fine piece of fourteenth-century work is to be seen. The edifice has been added to at several times, the tower being a fine specimen of Early Perpendicular work. Some of the inscribed stones removed in taking up the old flooring have been restored in the tower-floor; one or two bear evidence of ancient workmanship. Under the old system the church would only seat 250 worshippers, but it will now accommodate fully 400. The edifice will be heated throughout by flat hot-water pipes, running on the same level as the tower-floor. The work has made considerable progress. Another church already gives evidence of a comfortable and commodious edifice.

THE NEW GERMAN INDUSTRIAL MUSEUM, BERLIN.

INTERIOR VIEW.

A FEW weeks ago* we furnished an illustration of the building now in course of erection in Berlin, under the direction of Professor Gropius, for the New German Industrial Museum. Particulars of its principal architectural features were given at the time, and we need only add that the museum, when completed, will form the corner of the Zimmerstrasse extension, near the War Office, that it will cover an area 230 ft. square, and have an elevation to the roof of 88 ft. 6 in.

We are now enabled to supply an interior view of the building, representing the inner glass-covered court reached on passing through the vestibule, approached by a staircase from the principal entrance. This court has a length of 131 ft. 6 in., a breadth of 72 ft. 6 in., and is surrounded by arcades 16 ft. 6 in. wide, supported on square piers. Its centre will be occupied by a fountain surrounded by plants. This court is to serve for the exhibition of works of the plastic arts of large size.

THE HALL OF THE TROCADÉRO.

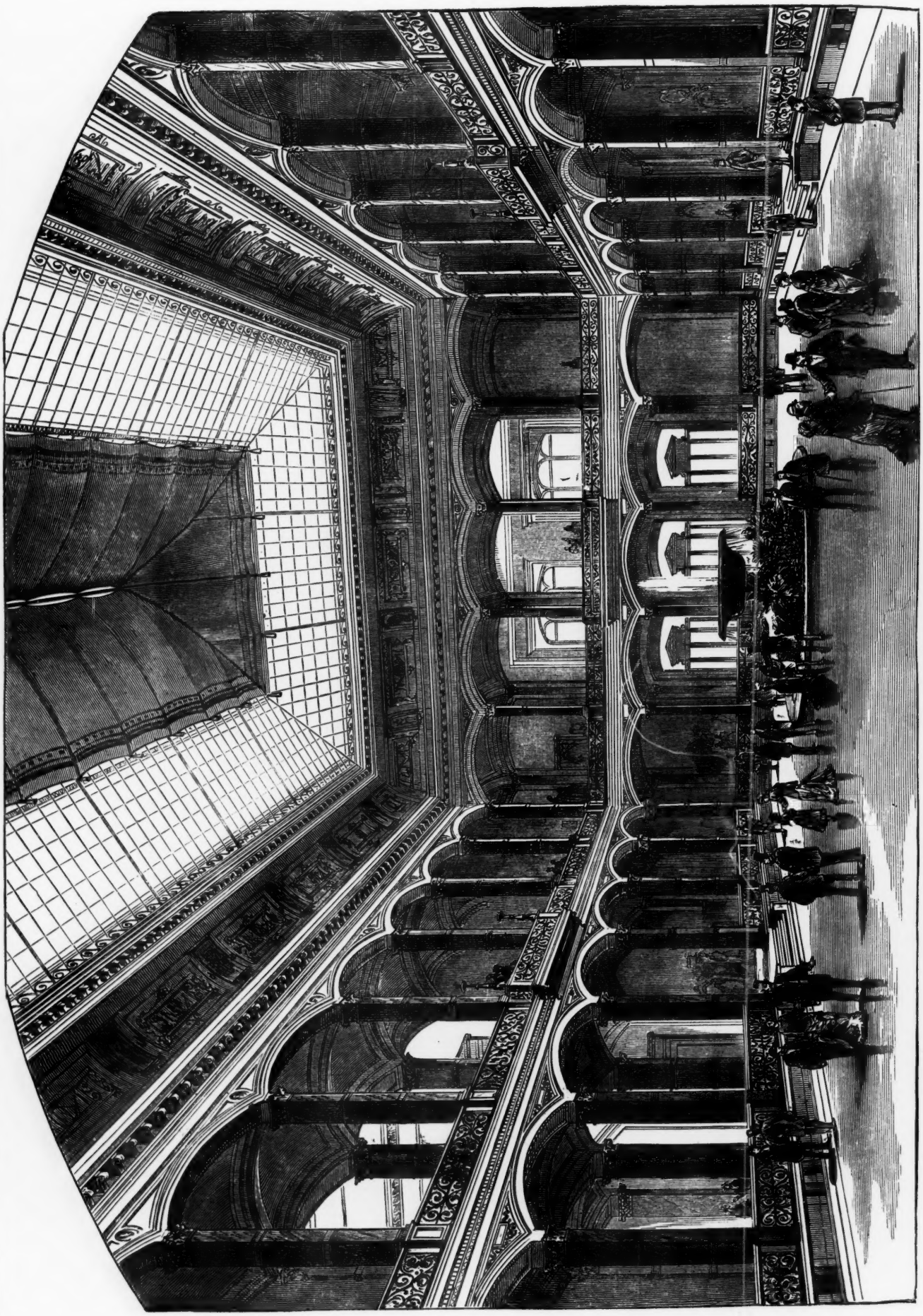
THE great hall of the Trocadéro has proved a complete success: capable of seating over 6,000 people, the faintest note can be heard by the most distant spectator. Ample light is secured from the immense bay windows, and the hall is well ventilated. A series of gilded sphynxes support the ribs of the enormous dome. The decorations, perhaps over-done, "*à l'article de Paris*," are, nevertheless, light and elegant.

The form of the hall is that of a horse-shoe,—the shallow, but capacious stage, forming the base, flanked by two columns supporting allegorical figures of Glory and Honour. Above the proscenium is a picture, painted by M. Lemaire, representing Peace inviting the nations of the earth to her throne. The stalls are raised on a very sharp incline, so that everybody enjoys an excellent view of the stage. Above the closed boxes at the back of the stalls is a row of open ones, while behind these rises the vast amphitheatre, and again, beyond, some boxes are formed in the wall. This great hall is kept religiously closed except on concert days, or when there are gratuitous performances on the grand organ. The public are then admitted at two o'clock; but, as these are rare, visitors have very few opportunities of seeing the interior of the Palace of the Trocadéro.

The correct views of the Exterior of this building† and the Façade of the Exhibition Building‡ were first given in our pages, and we believe the same may be said in respect of the Interior of the first-named building, which we now illustrate.

Fall of a Platform at Blackfriars Bridge. On the 19th inst., at about a quarter past three, a heavy wooden platform, built on the Middlesex side between the railway bridge at Blackfriars and that used for ordinary traffic, fell with a crash. The platform, which was on a level with the roadway, and supported by massive wooden beams, was built over the river, and used as a place for loading barges. At the time of the accident a barge was being filled with rubbish, carts being taken to the edge of the platform, and there tilted to allow their contents to pass down an incline. Fortunately, all the men at work were enabled to get away before the platform entirely fell, although there must have been many narrow escapes.

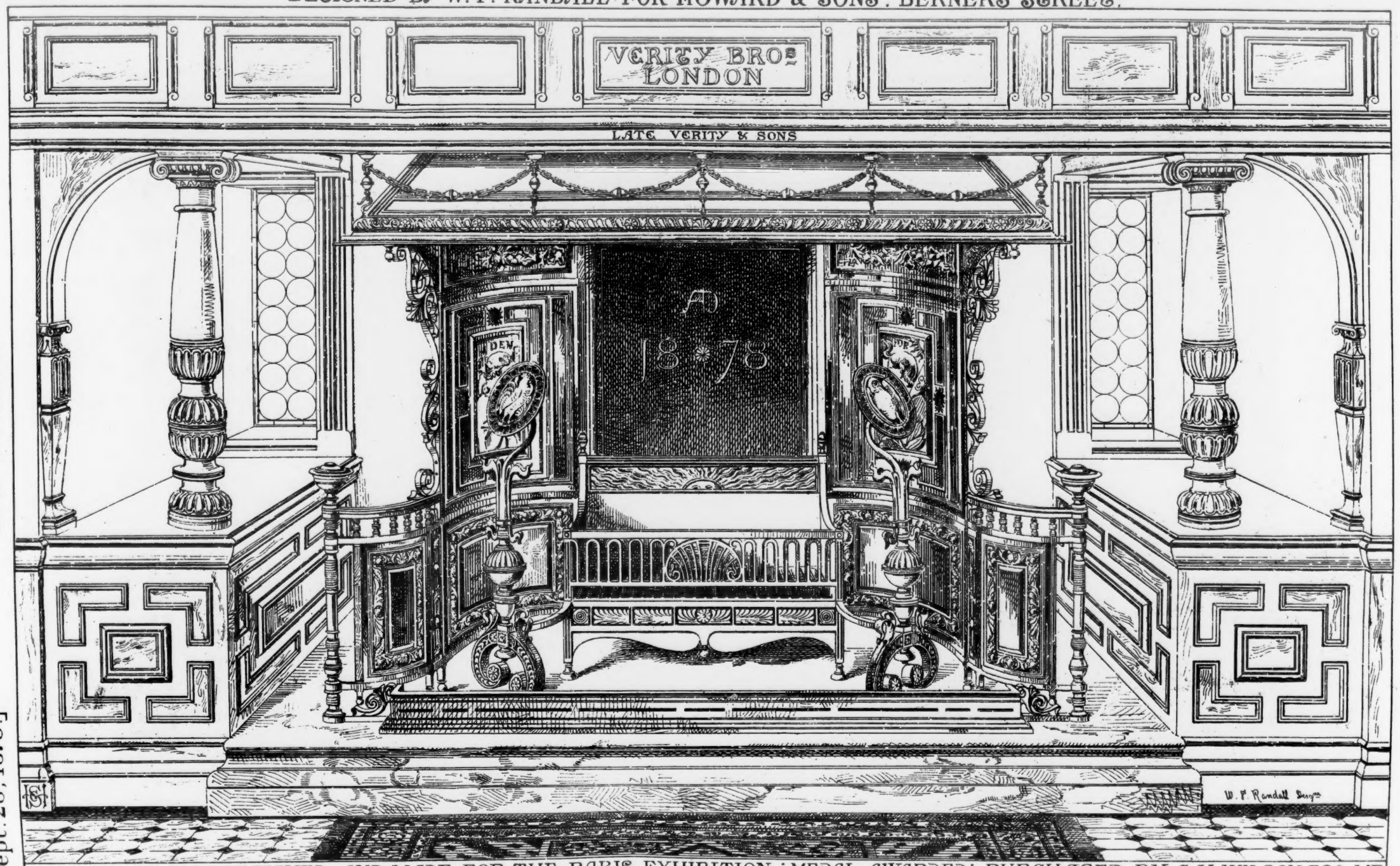
* See p. 750, *ante*. † Vol. xxxiv., pp. 1097-99.
‡ Vol. xxxv., pp. 761-63.



INNER COURT OF THE NEW GERMAN INDUSTRIAL MUSEUM, BERLIN: AS IT WILL APPEAR WHEN COMPLETED.
PROFESSOR GROPIUS, ARCHITECT.

Whiteman & Bass, *Photo-Litho to the Queen*, 236, Holborn.

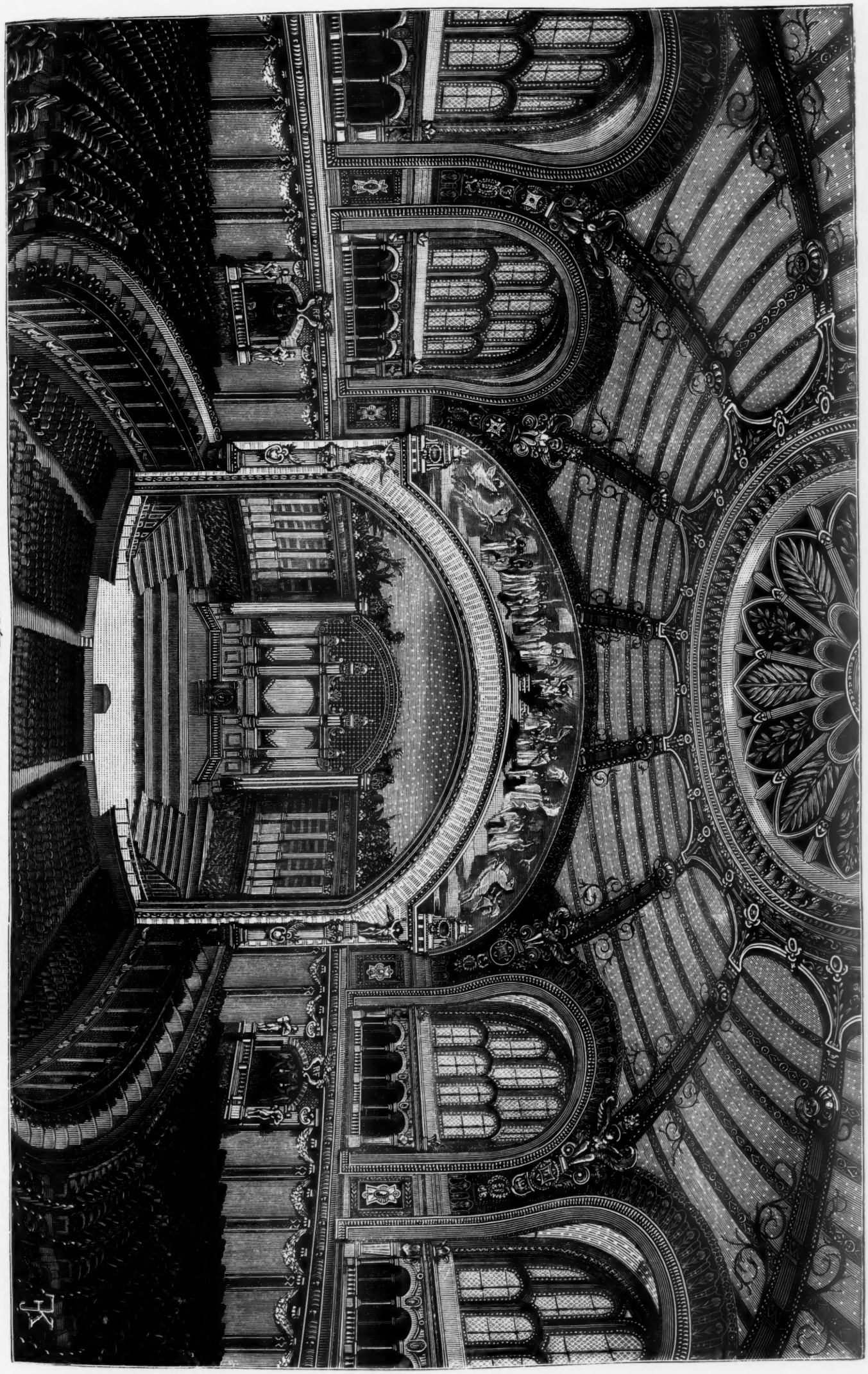
DESIGNED BY W. F. RANDALL FOR MOWARD & SONS: BERNERS STREET.



THIS STOVE WAS DESIGNED AND MADE FOR THE PARIS EXHIBITION: MEDAL AWARDED: PURCHASED BY C. H. WILSON ESQ MP

Whiteman & Bass, *Photo-Litho to the Queen*, 236, Holborn.

THE GREAT HALL OF THE TROCADERO, PARIS.—Messrs. Davioud & Bourdais, Architects.



THE GREAT HALL OF THE TROCADÉRO, PARIS.—MESSRS. DAVIOUD & BOURDAIS, ARCHITECTS.

THE TRADE UNIONS CONGRESS AT BRISTOL.

As we have already stated (p. 969), the eleventh annual Trade Unions Congress commenced its sittings at Bristol on the 9th inst. We have given an outline of the first day's proceedings. On the second day,

Mr. G. F. Jones, the president, delivered his inaugural address. After some introductory remarks, he alluded to a speech referring to the operation of trade unions made by Mr. S. Morley, M.P., at the meeting of the Bristol Chamber of Commerce, in April, and read a letter explanatory of that speech. On this the president remarked,—It is a kind of eulogium on trade unions for the good they have effected, both to employers and employed; in the second place, it contains a charge implying a change of policy, by creating an estrangement or alienation between masters and men; and then it suggests the necessity of introducing a system altogether different in its arrangements, and involving concessions in the method of conducting our negotiations. Now, the value and importance of trade unions to us who labour have been so clearly and forcibly demonstrated on former occasions, and to which your presence testifies, that it is a fact requiring no further proof. A very important programme still remains to be accomplished, and the successful carrying out of that programme will mainly depend upon the way in which we individually and collectively observe and value the first essential principle of the existence of our unions, viz., that they shall be purely voluntary. It is of the utmost importance that this voluntary principle should be maintained in its entirety, for it forms the basis of our political liberties guaranteed to us by the Constitution. It has been won for us by the sufferings and the sacrifices of our ancestors, and should be especially dear to trade-union workmen, because of their struggles to secure the right of combination. The sacredness of personal freedom should be held intact, and be defended at all hazards; for the violation of this principle will but endanger the common cause, and jeopardise the very existence of our unions. Another noticeable fact in regard to these and other gatherings of labour representatives is the altered tone of the Press in its comments on labour questions and working men's movements. This, undoubtedly, is a healthy sign of the times, and one that cannot fail to exert a beneficial effect on the public mind; for, in proportion as the Press is moderate, so will its influence with the working classes increase, and even its adverse comments on matters of policy be listened to with respect. With regard to the second charge, I fail to see the slightest tendency of modern times that is at all calculated to alienate employers from employed. In addition to the teaching of history, experience has long since demonstrated the fact that the invariable laws of trade unions, which relate to the question of wages, are a check to unfair competition, and a guarantee for just and equitable conditions of labour to each and every employer; and while they engender a spirit of self-respect, they inculcate thrift on the part of its members, and in contradistinction to the wild assertions frequently made that their tendency is to reduce the energetic to the level of the mediocre workman, I am bold to assert that, on the contrary, they encourage emulation, both as to methods and skill, and they tend to elevate the character of the members by cultivating habits of industry, sobriety, and providence,—social elements which cannot fail to exert a beneficial influence on all with whom they come in contact, who are not previously blinded by prejudice. As to the question, what concessions are we prepared to make in the mode of conducting our negotiations with employers? I think it only reasonable to inquire what further concession is required. If it implies conciliation and arbitration, then I say these are no new features in connexion with our organisations; it is one of the fundamental principles of many societies, who not only enjoin its observance by their members, but make it imperative on the part of their officers, in all cases where applicable, to offer conciliation, or, failing in that, arbitration, thus casting the onus of disruption on the employers by their refusing to meet the men in conference; and yet the public mind is kept in a state of ferment by ignorant and irresponsible persons, who allege that trade unionists are opposed to all reasonable modes of settling the wage and other questions in dispute. One of the most remarkable incidents on record bearing on this question has just occurred at the recent meeting of the British Association in Dublin. The rarity and genuineness of the production will be my apology for placing it before you as a counterbalance to the statement of the hon. member for Bristol. In the Economic Section of the British Association, Mr. Campbell, in a short paper on the "Social Aspects of Trade Unionism," said:—

"The time seems almost to have arrived when all further attempts by argument or abuse to overthrow trade unions must cease, and these associations be recognised as a powerful existing feature in our social economy. Trade unions place workmen in a position to secure better terms in bargaining with their employers, and they are invaluable to the working classes in so far as they serve as benefit societies. It is, moreover, to the persistent agitation of these unions, aided by the efforts of philanthropists, that are to be ascribed the many legislative enactments of modern times against the employment of women and children in unhealthy and too-protracted labour; against the use of defective and dangerous machinery, and affording facilities for the erection of comfortable and well-aired dwellings. In so far as trade unions can consistently with the state of trade endeavour to equalise the fluctuations of wages, they are performing a function eminently beneficial to themselves, their employers, and the community. The confident belief that the difficulties between capital and labour would find their solution in the growth of the system of co-operation has been but indifferently fulfilled. It is evident that the extension of a system which would demand from our working men the unswerving attention and intelligent devotion to business required by the fierceness of sudden industrial competition—such economy and self-reliance as would accumulate the necessary capital, and secure a provision for seasons of depressed trade,—and above all, such a regard for economic laws, and such an unselfish interest in the welfare of their fellows as would prevent mutual encroachments—supposes a higher standard of social and intellectual refinement than at present exists among them. Towards the creation of such a standard, much has been done, and is still being done, by trade unions. And if they content themselves with supplying their members with accurate information of the state of the markets at home and abroad, and concentrate all their energies on the work in which they have made such rapid strides towards the social and intellectual advancement of the working men, they will have earned the sympathy and respect of all right-minded people, and their successors will reap the reward in benefits to which they could never have attained under the baneful dominion of strikes."

I commend the above to the careful consideration of all to whom it was intended to apply (not omitting our own responsibility in the matter); but I am fully persuaded that to the attainment of so desirable an object suspicion and prejudice are the two great obstacles to be overcome. The prejudice which found vent in the expression of Nathaniel of old, when he said, "Can a good thing come out of Nazareth?" is as deep-rooted as ever at the present day in the minds of many, some of whom sit in high places, and in respect to every attempt that is made by working men (especially trade unionists) to improve their position, is calculated to supersede these institutions which have been all-powerful in the past as a means of promoting the well-being of their members in all matters appertaining to their daily labours. The recent contests between capital and labour in the building trades in London and Manchester, and which (speaking plainly) resulted disastrously to the cause of labour, is fraught with interest, and the lessons they are calculated to teach should be carefully observed and stored up for guidance and direction in the future. I do not presume to question the legality of the disputes referred to, but will at once concede to them the right to be the better judge of the time and circumstances most favourable to their application; nor shall I do more than record the fact of the persistent refusal of the employers to conciliate with the men, nor the artifices resorted to in order to supplant the men on strike, because we have no legal or moral right to fetter the action of the employers; the perfect freedom of action we claim for ourselves must in honour be conceded to those who are opposed to us, even though they resort to the unpatriotic action of importing foreigners from the Continent and America in order to defeat the object of the men to whose industry and skill, doubtless, the majority are indebted for their exalted position. The enormous expenditure necessarily incurred in this foreign trade in human kind is to us comparatively unknown, and will doubtless remain a secret. The cost on the side of labour was correspondingly great; but the cause of unionism to-day is as good as ever, and reverses such as have been recorded during the year should stimulate its members to a careful study of the circumstances which led to the defeat; for it is a truism that to make light of what we are doing is to ensure failure. It is doubtless the first duty of the officers and members of the unions, when considering the propriety of asking for an advance of wages, to understand the condition of their respective trades, the demand for work, and the amount of business in prospect; these are essential conditions of the wages problem that require to be thoroughly understood. Assuming, then, that these requirements were fulfilled, how came it to pass that the subsequent attempts to enforce the demand so ignominiously failed? This recalls to memory the names of a number of gentlemen who have distinguished themselves in promoting useful legislation, and who have otherwise deeply interested themselves in advancing the cause of labour, all of whom have expressed themselves very strongly on this subject. Mr. Brassey, in his address to the Leicester Congress on this subject, said,—

"It is evident the problem cannot be solved without an intimate knowledge of the state and prospects of trade; it is not enough to understand the condition of the labour market in this country; an international knowledge of the situation is essential."

Again, in his essay on "Work and Wages," he multiplies instances where attempts, not only to raise wages, but even to resist a reduction, had proved futile in a declining or depressed state of trade. The theory here propounded, I confess, is both new and unpopular among trade unionists; it is, doubtless, one of those lessons that are hard to be understood. "And yet," wrote the late John Stuart Mill, "nothing is more simple than the political economy of labour." I am of opinion that the result of the contests alluded to affords the most convincing proof that the price of labour, like that of commodities, is governed by the proportion between supply and demand; the effect of a plentiful or a deficient harvest in raising or reducing the price of bread is familiar to every one; it is a fact of such common knowledge that it need not be enforced. The cases I have quoted are not mere speculation, but rather demonstrate the existence of two truths of great importance; first, that wages depend on the greater or less competition for employment; and, secondly, that it is not the employed, but the unemployed workmen who fix the price of labour. The connexion of these two propositions with the rapid increase of population must be apparent to all. It follows, then, that we are, to a great extent, the arbiters of our own destinies; for I am convinced that we have a higher and nobler mission to fulfil than to be perpetually engaged in the turmoil of costly and unnecessary labour disputes. Our real strength, as a community, lies in the heart and the brain, and the sooner we turn our attention to the consideration of these questions, earnestly and seriously, the sooner will this great problem be universally understood; until then we cannot look forward to any lasting improvement in the people. In the meantime, it is clearly our duty, as well as our highest mission, to husband our means and resources, having special regard to the ever-increasing claims on the benevolent side of the question, as well as for a day of need, when it becomes necessary to act on the defensive. It is with the deepest regret that I revert to the overt acts of violence and lawlessness which a short time ago were rampant in North and North-east Lancashire. It would have been to me a far greater pleasure to record the fortitude and law-abiding character exhibited by our kinsmen in the principality under the most trying circumstances, as applicable to each and every district; but there the fact remains, however much we may deplore it. And I feel it to be a duty incumbent upon me, with the greatest confidence of your undivided support, when I say that we have not the slightest sympathy with the perpetrators of the diabolical outrages that were committed, either on person or property, under any circumstances whatever. Perfect freedom of action we have already contended for, and again repeat; the policy of menace simply destroys the chance of reasonable concessions,—the very fact of disregarding the law under such circumstances simply means disaster for the workman. However good the case may be, the moment that law and order are set at defiance, that moment is the protection afforded by the law at once forfeited, and the chance of success irretrievably lost. The merits of the dispute, which contains the principle of limitation *versus* over-production, I do not propose to enter upon; but the refusal of the employers of every overture by the operatives is a significant fact, as is also the assurance we personally received that the depredations we deplore were committed by persons outside the pale, and, consequently, beyond the moralising influence, of trade unions. It is, at least, some satisfaction to know that during the recent crisis through which we have been passing, when trade unions have been fairly put on their trial, many of our tried friends have been faithful in their

allegiance to the cause of labour. Notwithstanding all that has been said and written derogatory to trade unions, it is gratifying to note that there are slight indications of a revival, and I know of no more effectual mode of silencing our opponents than by a consistent perseverance in well-doing, and with unflagging zeal, and increased earnestness and determination, enter afresh the arena of legitimate conflict, until the just and reasonable claims of labour are recognised and perpetuated to the generation that shall follow.

The Congress resumed the debate upon the Parliamentary report, and, on the motion of Mr. William Fitzpatrick (Liverpool) seconded by Mr. C. Williams (Birmingham), it was unanimously adopted, an amendment submitted by Mr. Laird (Newcastle-on-Tyne), in reference to skilled and unskilled labour, in which he suggested the insertion of the words, — "That the relations of iron shipbuilders and shipyard helpers were not satisfactory, and would not be until a mutually equitable system of work and payment was established," being withdrawn, after explanations given by Mr. Burnett and Mr. Broadhurst, the treasurer and secretary of the Parliamentary Committee.

On the question of employers' liability for accidents, Mr. Burnett moved that the best thanks of the Congress be accorded to Mr. Macdonald, M.P., for his services in urging the claims of his Compensation Bill upon the House of Commons; and requesting him to pursue in the future, as he had done in the past, the question of compensation until something like a satisfactory result was arrived at; and the Congress urged Parliament to pass into law such a measure as would satisfy the wishes of the workpeople of this country.

The resolution having been adopted,

Mr. Macdonald, said the matter was one he had for many years felt a very deep interest in. Since the year 1857 he had never hesitated by day or night, when he could get an opportunity, to endeavour to work upon the public mind for an alteration in the existing law. His reasons for that were these:—He firmly believed that it was the duty of those who get the profits of labour to maintain the poor that were caused in the operations that they derived a benefit from. In the next place, he had ever been of opinion that in proportion to the laxity of law for compensation there was a laxity in regard to the care for human life; and he felt perfectly convinced, because there was strong proof, that a law for compensation in accidents and deaths, making owners responsible where they ought to be responsible, would take off a third of the disasters that occurred in mines and factories and workshops. They would not occur had they a strong compensation law for the workmen. Up to 1837 what he wanted was the law of Scotland, and he merely asked that it should be again law. It was asserted, too, although it was combated by many men of eminence, yet it was asserted by Mr. Lowe and Lord Justice Brett, that it was the law of England as well, and that the whole change and departure that had taken place was due to judge-made law. He affirmed here what he affirmed in the House of Commons, that there was no form of law half so dangerous as the law made by the judges in this realm. He heard nothing of that law as it now stood till 1837. The greatest departure had been made by the Lord Chancellor of England, Lord Cairns; and if that state of things did exist, his desire was to get the law as it formerly was. And if it was not formerly so, then, looking at the altered condition of things, at the increase of machinery, and many more dangerous appliances in the productions that went to make their country great, they had come to a time when they should have a law, in order to have a simple check upon the employers for their servants, making them responsible for preventible accidents to such servants. They were met now by a very formidable opposition in this matter. He noticed the other day that at the meeting of the Associated Chambers of Commerce, held at Sheffield, the question was taken up, and of course their view was that the Bill introduced by himself and others was a very dangerous measure. Mr. Mundella, the member for Sheffield, was reported to have said he agreed that, if they were to carry Mr. Macdonald's theory so far that the employer was to be made responsible for every act of every workman, the result would be that they could not carry on the business of the country. He (Mr. Macdonald) again asserted that they carried on the business in Scotland, and that they made Scotland great as a commercial country; also, that the law as they wanted it in England was what the law of France now was. The cry heard above all others during the last few years was, that the unreasonableness and the exacting demands of the working classes would drive trade from the country. They were told if they insisted upon having a Bill of this kind, the employers would take up their capital and go to Germany. But the law of Germany was nearly what they wanted the law to be here, and it was so with regard to France: and he wondered that one so intelligent as the hon. member for Sheffield should have ventured to have made such a statement as that the passage of the Bill would prevent the business of the country being carried on. But if they sought to meet all the cavils raised against a measure of this description, their whole time would be wasted. The principle that had governed him through life had been that, having satisfied himself that a principle was right, to march steadily forward irrespective of slander or reproach, which would fall behind them, and they would be sure to accomplish their purpose. After referring briefly to the position of the Bill, Mr. Macdonald said there were nearly a thousand petitions last year, but next year let them have ten thousand,—let them have petitions from every workshop, every factory; from every railway office; from every mine; and let them have them also from the agricultural labourers, for they were exposed to danger. Let them have one cry throughout England and Wales for the same redress for workmen as the public had against employers, and if sufficient pressure were put on he believed there would soon be a law made satisfactory in its character, and which would contribute to the safety of the working classes in a way which the law at present did not do. He trusted the result of this congress would be that every one would go away with a thorough determination to attain the object in view, and when the victory was completed the honour would be the greater, because truth and justice were on their side, and must prevail if they were in earnest.

Mr. Memmott (Sheffield) brought forward the subject of patent laws. He said they knew great depression of trade existed, and they had had to undergo great hardship in England. They were told from time to time that they were being outdone by foreign countries. It seemed to him that they were giving a premium to foreign countries to outstrip the English. If any working man in England got an idea into his head whereby he could cheapen production or improve an article he worked upon, if he desired to have the benefit of that skill, down came the Government upon him for a tax, something like 200*l.*, which of course prevented that man from realising the benefit of his invention. But if that man chose to take a trip across the Atlantic and introduce his invention there he might get it through for about 7*l.*, and then America got the benefit, whereas had their own laws not been so oppressive, England would have had the benefit of the invention. Mr. Memmott then moved,

"That this Congress regrets the delay in placing the patent laws of the country upon a satisfactory footing, and desires the Parliamentary Committee to continue their efforts to secure to the inventor, by reasonable payments, the benefits of his invention."

On Wednesday, Mr. Crompton, a barrister, addressed the Congress on the subject of the summary jurisdiction of magistrates, after which,

Mr. John Morley read a paper on "Overproduction."

During the subsequent proceedings of the Congress,

Mr. Slatter (Manchester) moved a resolution giving instructions to the Parliamentary Committee to prepare and introduce into the House of Commons, at the earliest opportunity, a Bill to reform the jury system, based upon the widening of the institution by lowering the qualification, and the payment to jurymen of such moderate compensation as will secure the poorer jurymen against actual loss. This was unanimously adopted.

Mr. Fitzpatrick (Liverpool) moved a resolution, recommending the extension of the provisions of the Employers and Workmen Act to seamen, saying that the only working man now existing who could be seized and imprisoned for not fulfilling a contract was the British seaman. This was also adopted.

Mr. Birtwistle (Manchester) proposed that in view of the Factory and Workshops Consolidation and Amendment Act coming into operation on the 1st of January, entailing considerable additional labour upon the already insufficient and consequently overworked inspectors, the meeting, in order to prevent the Act becoming a dead letter, instruct the Parliamentary committee to take immediate action to secure the appointment of a considerable number of respectable practical working men as assistant sub-inspectors.

Mr. Cocking (Blackburn) seconded the motion.

Mrs. Patterson suggested that the words "and women" should be added after working men, but the suggestion was not accepted by the mover of the resolution.

A Manchester delegate said no inspection would be complete and honest without the appointment of a certain number of female inspectors, and, referring to the large wages earned by tailoresses in the city from which he came, often amounting to 2*l.* and 2*l.* 10*s.* a week, said they frequently worked in large numbers in small rooms, and on sanitary as well as other grounds inspection in such cases was much to be desired.

Mrs. Patterson moved, as an amendment, the insertion of the words "and women," and contended for the appointment of female inspectors.

Mr. Broadhurst (London) hoped the Congress would not put itself in the position of asking Parliament to appoint women as inspectors, knowing that they had always opposed the extension of the Factory Acts themselves. One reason why he had doubted the wisdom of inviting ladies to their congresses was that by their persuasive eloquence and manners they might be led into an illogical position, and be found voting for a proposition which, in their more rational moments, they would not have entertained.

After an animated discussion, the amendment was carried, 46 voting for it and 33 for the resolution.

Mr. Rhodes (Tunstall) moved a vote of thanks to Mr. Burt, M.P., for his efforts in bringing before Parliament the question of providing efficient persons to take charge of steam-engines and boilers, and the resolution expressed the opinion that no person should be employed in such a capacity who had not passed an examination and obtained a certificate of competency.

Mr. Macduff (Glasgow) seconded the proposition, which, after a brief discussion, was adopted.

Mr. Adam Weiler (London) then read a paper on shortening the hours of labour, in which he said, that since it had been proved by statistics, and high authority, that the working people by over toil did not attain the age they might attain under more favourable circumstances; and since it was well known that a large proportion of the working classes could not obtain employment, and that labour had in most instances to be sold at less than the recognised cost of living, he had come to the conclusion that the best means of improving their condition was to reduce the number of hours of toil, the effect of which would be to give every worker a better chance to obtain employment, and by that means lessen the sort of competition which was caused by hunger and want; secondly, it would give time and opportunity for rest and amusement and the cultivation of their minds. It would, he submitted, be a lever against unfair competition, if the working classes agreed not to sell more of their daily working power than they could afford consistent with their health, mental culture, and general welfare, and he believed that the reduction and equalisation of the hours of labour guaranteed by law would be a great step towards improving the position of the working classes.

On the motion of Mr. Davies, seconded by Mr. Toyne, it was resolved:—

"That in the opinion of this congress the subject of federation of organised trades is of the utmost importance, and deserves the serious consideration of the Congress and of trade societies, and that a copy of rules be prepared by the Parliamentary Committee and sent to all trade societies at least four months prior to the next Congress, and to be returned two months before that time with such alterations as they may deem necessary, so that the question may be brought before the Congress for consideration."

Mr. Lindsey (Birmingham) proposed:—

"That this Congress, recognising in the co-operative movement a great and beneficent means of assisting in the elevation of working people, hereby desires to express its heartfelt sympathy with both the distributive and productive aspects of the co-operative principle, and trusts it may further extend and develop among the people."

As a trade unionist of twenty years' standing, and co-operator of eighteen years, he had had opportunities for watching the conduct of these

institutions, which gave them facilities for investing small savings. Co-operation, too, helped them in a trade union aspect, because their difficulty was that their capital was their labour, while this gave them a chance of becoming capitalists. Co-operation and trade unionism combined instilled into their minds respect for capital when they partook of the benefits.

Mr. Ball (Leamington) seconded the motion, urging that as men became more intelligent they would have co-operation on a larger scale.

Mr. Davey (Gateshead) said he was sorry to have to move an amendment, but the action of co-operative societies in reducing the wages of their own servants was detrimental to the best interests of labour. He moved as an amendment,—

"That in the opinion of this Congress the principle of co-operation, if fairly carried out, is calculated to improve socially the condition of the working classes, but the system invariably pursued by co-operative stores committees in reducing workmen's wages below the ordinary employer is detrimental to the best interests of labour. That we, therefore, request the Congress to use its influence with the different societies to pay their *employés* at least the average wages of the district."

Mr. Thornton (Nottingham) seconded the amendment.

On a division, the amendment was rejected, and the motion carried by 39 to 28.

Mr. W. Count (Bristol) proposed,—

"That recognising the necessity of labour being properly represented in Parliament, this Congress recommends all trade unions to do the utmost in their power to return competent men of their own class to Parliament, and likewise to agitate, so far as possible, for the advancement of manhood suffrage as the basis of representation."

The motion was agreed to *nem. con.*

The final sitting of the Congress was held on Saturday, the 14th inst., when

Mr. H. Broadhurst was unanimously re-elected secretary of the Parliamentary Committee. The Congress next elected by ballot the Parliamentary Committee as follows:—Mr. J. Burnett, London engineers, 73 votes; Mr. Prior, Manchester carpenters, 68; Mr. Ball, Leamington labourers, 62; Mr. Birtwistle, Accrington weavers, 60; Mr. Slatter, Manchester printers, 58; Mr. Shipton, London Trades Council, 53; Mr. Knight, Liverpool boiler-makers, 52; Mr. Crawford, Durham miners, 50; Mr. Inglis, Glasgow blacksmiths, 48; Mr. Fitzpatrick, Liverpool Trades Council, 39.

The next business was the selection of the place for the next Congress. Mr. Patterson of Glasgow, moved, and Mr. Inglis, of Glasgow, seconded, that the next Congress be held at Edinburgh. Mr. Judkins moved that it should be held at Oldham. Mr. Count proposed Cardiff, and Mr. Richards Birmingham, and when the vote was taken there appeared 55 for Edinburgh, 28 for Oldham, 5 for Cardiff, and 4 for Birmingham. The President, therefore, declared that Edinburgh was selected as the next place of meeting.

Mr. Shorrocks (of Manchester) moved,—

"That the action of certain daily and weekly newspapers, both in London and the provinces, in refusing to publish advertisements for men to keep away from cities and towns where disputes are pending or expected, is contrary to the principles of justice and equality, and seeing that all newspapers accept similar advertisements from employers with the union and non-union workmen while disputes are pending or expected, we strongly condemn such proceeding on the part of newspapers practising the course complained of."

Mr. Harry (of Manchester) seconded the resolution, and it was carried unanimously.

ANOMALIES IN ARCHITECTS' PRACTICE.

SIR,—All of us have discussed, with ourselves and with plenty of others, the subject of variations from contracts so frequently, that we are a little indisposed to touch the thorny subject when not compelled to do so. Mr. T. Roger Smith has, however, done such useful work in fixing and improving professional practice, that sheer gratitude should lead us to steady consideration of suggestions from him, which are sure to be of value. Let us, ostensibly in consideration for an outsider who may read the correspondence, but quite as much in order to arrive at clearness and common ground, make a miscellaneous note or two.

1. Drawings and specifications should be complete and definite, in respect of all the works to which they are intended to apply,—as nearly perfect as skill and pains can make them. It is useless to expect that they shall comprise everything in any building—certainly in any large building. Human nature, and the conditions under which actual work is done, may settle that. Still every important matter should be well thought out, and well laboured in detail. If this could be always the case, no considerable wrangling about extra or no extra could occur. At times, special pains are taken to recite in the specification what the contract does *not* include, so that the employer may be compelled to see for himself the degree to which the completion is to be carried: and this guides other people usefully as well.

2. Some intelligent and active-minded builders' clerks are sadly given to self-gratulation at their own acuteness, and take an unbecoming pride in knowledge of weaknesses of the world. Without being indifferent to human progress, one might be contented to see the last examples of "turning every variation into an extra," ignoring omissions, and other graceful arts. Pointing out that trifling alterations, which may be ordered, involve extras, is not the easy-going way of carrying on business; and a contractor with his wits about him should cure himself and his people of such a habit,—trusting to the law of give-and-take, which right-dealing architects have an affection for. But that kind of precision is a leaning to virtue's side in comparison with a defective memory,—deviations made, for instance, to suit the contractor's convenience in getting in, maturing into full-blown extras in the course of a few months. The change of practice suggested by Mr. Smith would at least put an end to this. Such patchy memories,—here faded into blankness, there preternaturally vivid. It might, on the other hand, lead to constant little claims, and counter-arguments in writing,—all of which would remain in evidence for the arbitrator; or the desire to avoid more of them might be to the detriment of the building. Little improvements that suggest themselves in the execution of a building should be encouraged in every possible way.

3. The ordinary builder's bill should always be accepted by an architect as a document strictly *sui generis*. Legally, of course, it is a statement of claim; but, as a matter of practice, it is commonly understood to be merely, — the builder's *pourparler*,—a diplomatic paper, which shapes out the matter, and gives something to work further upon. It is a good plan to get this into the employer's hands as soon as possible after it is received. Delivered personally to a reasonable man, the architect says:—"This is A's account: make your own remarks, and see me again in the matter before I see him. Consider every item is uncertain till it is tested. The fair adjustment of such accounts in a friendly way is a matter of every-day occurrence."

4. It should be seen more clearly than it is by every one that important variations are a nuisance all round,—to builders as well as to the other parties to the contract,—unless a builder has an absurdly low contract, and looks to the chapter of accidents to right himself, if confusion threatens the accounts. As excuses for delays, variations are valuable,—but if extras and omissions are priced at the prices at which the rest of the work has been taken, the contractor would generally be better without the extra work;—at least, so his foremen will say, who know about countermanded orders, setting-out boards thrown on one side, workpeople idle for a day or two while things are got ready for them in another part of the job, &c. Many variations are made from sheer caprice; and part of the irritation in paying for them results from seeing little for the extra money.

5. The only suggestion I would make is to alter the clause of the contract into "ordered or admitted in writing by the architect." This would not, it is true, meet the case suggested by "A Firm of London Builders," where the architect becomes the tool of a piratical employer, being frightened into disallowing extras; builders must not work under such an architect again (if such there be). But it would do away with an anomaly in ordinary practice, and keep the power well in the architect's hands. The best way is to settle a price at once for our variation. Get a distinct authority from the employer, and order it distinctly. This has been done and might with advantage be more frequently done than it is; but that is moral sentiment, not ordinary practice. The next best course is to order extras in writing, being watchful and taking trouble about them, as I understand Mr. Field to say is his uniform practice. When counsels of perfection cannot be followed, then everything, or some number of things, will be left hazy till the end; the bill will come in in the ordinary way, and be fought out and settled fairly, or not agreed. Then the architect will examine his orders, already in writing, and add to them such admissions as are just. The arbitrator's duty will be to take these orders and admissions, and find for an amount. The intention of every building contract should be to make the architect the judge of the meaning of it, and a judge without appeal,—"his decision shall be final," except as to the actual amount to be paid, which is to be settled by an arbitrator, if need be. It appears to me that this is what architects should look to, and contractors should learn to desire it steadily, not fitfully, or as a bit of conventional commonplace.

I have occupied so much space with this "anomaly," that I must leave the others named by Mr. Smith for a future communication, unless some one, in the interval, says all that I have to say about them. S. F. C.

SIR,—In the hope that our principal and distinguished architects and builders will take this matter up, I venture to offer a few observations, feeling that, without countenance and interest are shown on this very important subject, no good will come out of it, unless those who have position and influence recognise the necessity of framing a code of rules, so as to set at rest many evils that frequently arise out of building contracts.

An experience of twenty-nine years in the building trade convinces me that, with the very best intentions on the part of all concerned in the successful carrying out of a contract, in many cases alterations, misunderstandings, and complexities occur during its performance, terminating in disappointment and loss of time and money, through different views being taken upon one or more "queries," and which often are only settled by costly litigation.

Now the questions are,—Why "every-day" disputes should not be set at rest? What is the proper method to be adopted to prevent them from occurring? Whose business is it to move first? And upon whom should the burden fall?

Without doubt, most architects, whilst protecting the interests of their clients, are in no way desirous that the builder should suffer; but there are a few who would not deem it their duty to give him much consideration, looking upon him as a person well able to take care of himself; but how is it when the builder is bound, as in many instances he is, to conform to the directions and decisions of the architect, and in cases where his decision is final? The builder may appeal, and appeal in vain,—there is no remedy.

It surely must appear that it is not just for any man to be sole judge of his own case, yet very often it is so; then, supposing the judgment does not meet with acceptance, many know the cost of endeavouring to set matters right.

But when any dispute arising out of a building contract is referable to arbitration, should not every point in that contract be sufficiently clear, so that the arbitrator shall not feel it expedient to suggest a compromise, as is often the case, ending in loss to one or more of the parties concerned.

I will not touch upon the many points which might well be ventilated, because they are already known to most men of experience in these matters, but I am of opinion that if some course were adopted to prevent questions occurring from "anomalies," much time, money, and trouble, and many heartburnings, would be saved. A BUILDER.

ON SHAMS.

SIR,—I would preface this letter by stating that since my communication upon the "Decoration of St. Paul's," I have seen the essays of Dr. Anderson upon "Grecian and Gothic Architecture," wherein I find that so far back as the year 1800 he expressed similar views to those contained in my letter to the *Builder*, Aug. 17. These essays, though not generally known, are the finest that had been written upon the subject up to that time, and probably have not been equalled since.

"Meter's" latest effusion in favour of shams is certainly unique and original. Thus far they are commendable. Nothing would probably be gained by prolonging this controversy, especially on the part of such "sensitively conscientious" individuals as those who are enrolled under that contemptible "piece of bunting" so flippantly alluded to by your correspondent,—were it not that the generality of art criticism takes cogni-

sance of "shams," and rightly deprecates their introduction into any work or composition professing artistic merit. "Meter's" argument tends to degrade art rather than elevate it, and will no doubt persuade the *unthinking* into the belief that an unlimited licence is allowed in design. He alludes to things that have been, and concludes that they ought to continue, and is evidently somewhat of a pessimist in regard to art rules, and in all other things a devout optimist, admitting the literal rendering of Pope's line,—

"Whatever is, is right."

We are told to sham nature "wisely," but the difficulty is to clearly define the line where "shamming wisely" begins and where it ends. Every art-worker has not a genius at his elbow to stay his hand when overstepping the legitimate boundary-line, which even "Meter" himself does not attempt to define. Until this line of demarcation *is* clearly defined, we poor "sensitively conscientious" anti-sham agitators must stand by our "flimsy piece of bunting," and allow "Meter" to exhaust his stock of caustic epithets upon those whom he terms "*followers of this flag, or, rather, rag.*" Such language may be edifying to the writer, but it will fail to convince his readers of the soundness of his arguments. Controversies in the *Builder* are invariably conducted with praiseworthy regard for temperate language, and I do not remember to have seen before in its pages such a display of the bombastic as that which characterises the earlier portions of "Meter's" communication. "Meter" endeavours to evade criticism by writing,—"Let us hear no more about shams." This is an endeavour to quiet "sensitively conscientious" people by pooh-poohing their opinions.

He cites several instances of "shams" in nature as a justification for their propriety in art. He here enters upon a phase of the controversy into which I cannot follow him, as, by asserting that nature "foists shams" upon us, he indirectly assumes that these things were so *ordained* as to wilfully and designedly deceive us. But this is not the case; for are we not endowed with intellect and understanding to discover for ourselves that things are not what they seem? Hence there is no deception.

To my mind, the bare existence of such practices in art as "Meter" has enumerated are no proof of their desirability, legitimacy, or truthfulness. He alludes to Wren's "sham" dome and the "lying Gothic" which trickles up to the vault and clearstory. Wren's dome is not a sham; and when we are familiar with the superior wisdom which prompted him to adopt this feature, we at once acquit him of any attempt at deception, or the intention of perpetrating a "sham." If nothing else would save the dome from being considered a sham, the *eye* alone prevents it from becoming ostensibly the real covering.

What "Meter" calls "lying Gothic," and his allusion to the "sly buttress," is what every other writer considers the most truthful feature throughout the style.

After all, I scarcely think "Meter" has got hold of the right word when using "sham" as applied to art. There is a wide difference between representing or portraying nature and "shamming" nature.

The legitimate portraying of nature is no deception. The intention of a sham, its whole *raison d'être*, is to deceive. Given A, you produce the sham or imitation B, and the intention is to foist upon C the sham B as the original A. "Meter" had better look about for a more expressive word than "sham" as applied to the whole of the fine arts. The word "sham," as applied by me to certain portions of St. Paul's, was the only expression that could be employed, for it had reference to painted architecture placed in a position where the spectator invariably expects to find real structural parts, and not *imitated* ones. JAMES GEO. BUCKLE.

Royal Institute of British Architects. The secretaries of the Institute are very properly stirring up the members and others to provide papers on matters of architectural interest, to be read during the session 1878-79. They ask, too, for suggestions of subjects for discussion, and any particular questions members would like to ventilate or examine. Each contributor of a sessional paper is allowed two page illustrations; but a larger number of illustrations are allowed at the contributor's cost.

NEW BUILDINGS FOR POOR-LAW ADMINISTRATION.

South Shields.—Extensive buildings are now in course of erection for the South Shields Union, in Harton-lane, to the south of Tyne Dock Station. The site is four acres in extent. There are four separate erections. The entrance building comprises porter's lodge and accommodation for casual paupers. To the left, standing back, is the main building; to the right the schools; and still further behind, between these two, is the infirmary. The main building and the schools consist of five blocks each, connected by corridors, and the infirmary of two blocks, connected by corridors to the residence of the matron, in the centre. The buildings, which are to accommodate 700 persons, are of brick, and the contract amounts to 41,000*l.* or 42,000*l.* Mr. Joseph Hall Morton, of South Shields, is the architect, and the work is being carried out under his superintendence, assisted by Mr. Cobham, clerk of works. The contractor is Mr. Edmund Suddards, and the work is well advanced towards completion.

Sheffield.—The corner-stone of a new workhouse which the Sheffield Guardians are erecting at Fir Vale was laid on the 16th inst. by Alderman Searle, chairman of the Board. The cost of the building (according to the *Sheffield Independent*) will be something like 180,000*l.*, and accommodation will be provided for 1,800 inmates. The site chosen, though near the town, is completely in the country, being entirely away from the smoke and bustle of the town, and out of view of it. The principal frontage, stretching from north to south, will be nearly 1,100 ft. long. In the centre of this is a tower, 120 ft. high, in the upper part of which is a clock, and under the same is the principal entrance. The buildings are to be of red brick, made on the site, having bands or courses of stone, and black and white bricks. There are six departments or divisions, namely:—(1), the main building for general paupers; (2), the asylums; (3), the schools; (4), the hospitals; (5), the fever hospitals; and (6), the vagrant wards. Each department is separated from the other by a road, varying from 30 ft. to 40 ft. in width. The total length of roads is over a mile. The buildings intended to be erected will accommodate over 1,800 paupers, in addition to officials and nurses; but those at present in course of erection will accommodate only 1,662. The main building, which stands in the front and in the centre of the group, is divided into three compartments, which are connected by corridors 9 ft. wide. The centre part is administrative, containing a committee-room, offices and rooms for the officials, a large general waiting-hall; a large kitchen, 64 ft. by 54 ft., for the general cooking; and a dining-hall to accommodate 700. It is intended to supply all the departments with food from the kitchen, access being given by the corridors on the basement. The north wing of the central building is to be set apart for men, and it will be subdivided into four sections, each section having separate yard and exercising ground, and a separate entrance, with staircase communicating with the general corridor. Situate at the back of the wing are the bakehouses, workrooms, &c. The south wing will be set apart for women, and is similar in arrangement and subdivisions to the north wing, but at back of the same are the washhouses, laundry, &c. This main building will accommodate 774, besides officials. The asylums will lie to the south of the main building, and are separated therefrom by a 40 ft. road. They will accommodate 200. The men's asylum is on the east side, and the women's on the west side, 170 ft. apart, and between them, midway, are the dining-hall, washhouses, workrooms, &c. The schools are to be on the north of the main building, and separated therefrom by a 40-ft. road. They will accommodate 300 children, and the buildings are similarly arranged to those of the asylums. The hospitals lie to the west of the main buildings, and are to be built on the block or pavilion plan, and are connected by an open covered way. The centre blocks are administrative, containing surgeons' rooms, officials' and nurses' rooms, kitchens, washhouses, laundries, &c. The remaining nine blocks are for patients who may be classified according to the diseases they suffer from. The accommodation in the hospitals is for 366. The position of the fever hospitals is to the west of the general hospital, and divided therefrom by a road. In the middle of the ground the administrative block only is to be built, and there is a space on both sides of this available for either permanent buildings or temporary structures, as may be hereafter thought advisable. This plot will be walled round. The entrance buildings are a quarter of a mile from the general group. In them are comprised the vagrant ward, for sixty men and twenty women, on the cellular system. In this group also are the probationers' wards and the porter's lodge. Mr. Hall, of Sheffield, is the architect, and the contractor is Mr. J. Garlick, of Birmingham.

Lincoln.—At the meeting of the Lincoln Board of Guardians on the 17th instant, it was resolved, on the recommendation of a committee, to make certain additions and alterations at the union workhouse, at a cost estimated at 7,000*l.*, according to plans prepared by Mr. Watkins, architect. At the same meeting a discussion took place respecting the drainage of the house, for which Messrs. Bellamy & Hardy, architects, were some time ago employed by the Board to prepare plans, which, however, have not yet been carried out, owing to uncertainty as to what would be done in the way of alterations to the buildings. Some misunderstanding has arisen as to the remuneration which Messrs. Bellamy & Hardy were to receive for the plans. The guardians have paid a commission of 2½ per cent., and some of them were under the impression that that payment was in full discharge of Messrs. Bellamy & Hardy's claim. Those gentlemen, however, only regard the sum already received as a payment on account. In the course of the discussion, Mr. Battle said he hoped that so soon as they decided to carry out the plans for the new buildings, the drainage works would be carried out at the same time, and that the work would be all done together by one architect.

THE FUTURE OF SADLER'S WELLS AND THE LYCEUM THEATRE.

THE misunderstanding between Mrs. Bateman and Mr. Henry Irving has resulted in the former becoming the lessee of Sadler's Wells, which has recently been rebuilt, but only occupied since as a place of low-class entertainment. When the reconstruction of the theatre commenced, the intention was to convert it into a skating-rink, and a considerable addition was made to the area of the building by enclosing and adding to it an open piece of ground in the rear. The skating-rink mania, however, collapsed, and the theatre was eventually reconstructed on a much enlarged scale for its original dramatic purposes. Both the auditorium department and the stage are of much larger dimensions than those of the old house, and we learn that the interior is being handsomely decorated in anticipation of the opening some time before Christmas. Miss Bateman (Mrs. Crowe) is, we understand, to be the leading attraction; and her two sisters, Miss Isabel Bateman and Miss Virginia Bateman, will be members of the company.

With regard to the Lyceum, it is stated that the differences between Mr. Irving and Mrs. Bateman had reference to the *personnel* of the company. Mr. Irving is said to have told Mrs. Bateman that he was resolved to have *actors* to act with him, and not dolls, otherwise he would no longer play at the Lyceum. The result was that Mrs. Bateman threw up the management of the theatre, and Mr. Irving takes her place. In an address last week to an audience at the Alexandra Theatre, Liverpool, where he has been performing, Mr. Irving stated that he had not become the manager of the Lyceum solely to make money, but mainly to promote true dramatic art, and in that effort he felt assured he should be supported by his company.

Church at Slough.—On the 24th inst. the Bishop of Oxford consecrated the enlarged parish Church of Upton-cum-Chalvey, better known as Slough. The old church was built about forty years ago. Mr. J. O. Scott prepared plans by which a chancel, chancel aisles, large transepts, and one bay of a new nave have been added, affording 380 fresh seats. A stone and marble rood-screen is a prominent feature in the building. The architecture is of the Transitional period. If funds can be obtained, it is proposed to build a memorial spire to the memory of Sir W. Herschell, the astronomer, whose telescope stood on the spot occupied by the present tower.

SIGNS OF THE TIMES.

OUR, in most respects, excellent contemporary, the *Athenæum*, after abusing and sneering at the whole profession of architects, and advising the employment of other persons in lieu of a professional architect, states, with apparently some little indignation, that Sir Edmund Beckett, Q.C., has been appointed to supersede Mr. Street as architect to the diocese of York, including, the writer supposes, the charge of York Minster, and adds that this appointment "is not the only, nor by any means the least justifiable, instance of a tendency we observe on the part of custodians of ancient buildings to entrust these remains to others than professional architects." If the statement be true the *Athenæum* ought rather to feel proud that its advice has been already so largely followed. We are disposed to regard the announcement as a joke. Sir E. Beckett (we should think) is too clever a person to place himself in so ridiculous a position. "A Sheffielder" complains to us of what he deems the improper conduct of Sir E. Beckett in cutting and mangling the drawings and specification of an architect of the writer's acquaintance; but we must know a little more of the matter before giving publicity to his statements.

CONDITION OF TENBY.

SIR,—In the letter on the above subject by Mr. Burns, published in your columns, as if to make the pill still less palatable he commences with a justly deserved panegyric on the scenery and climate of Tenby; but he quickly changes his tone, and the death-rate as furnished by the Registrar-General supplies him with a pretext to deliver himself of a tirade against the authorities of the town.

By those who know Tenby, and especially those who are acquainted with Mr. Burns's relations to the Sanitary Authority, his remarks would be treated with contempt. As, however, the letter in question will likely reach others who do not know Tenby, and those are probably the persons it is meant for, I ask you to publish the following particulars. . . . .

As to the death-rate published, it is not the death-rate of Tenby, but of the Tenby district, which includes, besides Tenby, no less than thirteen rural parishes, including the parish of St. Michael, in the borough of Pembroke, a poor, unhealthy place, where the death-rate for the last quarter was 42 per 1,000. The death-rate of Tenby proper for the year ending June 30th, 1878, was as follows:—Quarter ending September 30th, 1877, 13; quarter ending December 31st, 1877, 20; quarter ending March 31st, 1878, 30; quarter ending June 30th, 1878, 27. Total, 90 deaths. Of these, ten were visitors, who were practically sent here by their medical advisers to die. Taking the remainder, and estimating the rate by the present population, over 5,000, it will be found that the death-rate of residents is only 16 per 1,000, and of these, nineteen were infants, eight were over eighty, and twenty-eight over sixty years of age, only seven dying from zymotic disease. Mr. Burns cites Herne Bay as an example; but the average death-rate, even of Tenby district, for the last ten years, is only 18, whilst that of Herne Bay is 20 per 1,000. In two of the last five years there appears only one death from zymotic disease, a fact that can be said about very few, if of any other town in the kingdom.

To show that the authorities are not unmindful of anything which may be prejudicial to the health of visitors, I may mention that within the last eighteen months they have spent 1,400*l.* in draining a marsh over which they had no control, being out of the borough, but which was considered in obnoxious proximity to the town, and so have rid any nervous visitors from the fear of miasmatic influences.

Mr. Burns says that in many places there are no drains, and foul cesspools still exist. The fact is that there is not a street in Tenby but what has a drain, and the cesspools are reduced to very few.

The sewage has three different outlets, the greater portion being carried to a farm a considerable distance from the town, and utilised for irrigation. Only on one of these outlets, by the greatest stretch of his imagination, can Mr. Burns's assertion of a force-pump apply, and on this there is a flap-valve arrangement to prevent anything of the kind.

As to the water supply, he makes a most deplorable tale about the contamination of the old reservoir (be it remembered the one he was engaged upon), but it will be sufficient refutation to publish the following analysis of the water made this year.

	Grains per Gallon.
Total solid matter	15·20
Loss on ignition after deducting combined carbonic acid	2·42
Lead and copper	None.
Iron	Slight trace.
Chlorine, calculated as chloride of sodium	3·74
Hardness before boiling, 5·2° (Clark's scale). After boiling, 4·8°.	
Nitrogen as ammonia	0·0036
„ Albuminoid ammonia	0·0027
„ Nitrates	0·0560
„ Nitrites	Trace.
Total nitrogen in these four forms	0·0623
Oxygen absorbed by organic matter	0·0160

This sample had a satisfactory smell and taste, but there was a good deal of suspended matter, and the colour was dark yellow: the microscope showed only a few traces of rootlets. The chemical results showed that the water was satisfactorily free from nitrogenous compounds, and the chlorine and hardness were low. This must rank as a first-class water.

As to the new reservoir, "considerably below the level of the adjoining highways," in Mr. Burns's language, means something less than 12 in. One of his highways is only a bridle-path or cart-way to some fields, and the reservoir is protected from the other by a wall and thick-set hawthorn hedge, 10 ft. high.

Mr. Burns says four years ago a plan was prepared, which, if properly carried out, &c. This is the scheme mentioned before, and I need only say that the work has been carried out by Mr. Hassard, of Westminster, well known to you in connexion with the scheme for supplying London with water from the Cumberland Lakes.

Mr. Burns says the Town Council were duly warned, &c. May I state that the only person who complained was himself, and he did so in a letter which he sent to one of the members of the Council.

Mr. Burns's attack might possibly have some weight with persons not acquainted with Tenby, but will be laughed to scorn by thousands, who, including the writer of this, have received incalculable benefit from this health-giving and beautiful watering-place.

HENRY T. MORLEY,
Borough Surveyor, Tenby.

P.S.—Since writing the above, Mr. Burns in another letter, amongst other erroneous assertions, says:—"The smells from the outfalls have been complained of by residents and visitors, and even at public meetings." This is not true. Mr. Burns refers to another matter altogether, which has been remedied, as stated in one of the paragraphs above. His assertion "that there are many open privies" is *absolutely untrue*. All the better class of houses have water-closets, and a modification is adopted for cottage property, viz., the closet is trapped and connected with the sewer, the flushing being efficiently done by means of a bucket of water and the ordinary house-slops, a system which appears to answer in cottage property better than the w.c. proper.

FRENCH WORKS AND FRENCH RESOURCES.

DURING the late ceremonies at Boulogne M. de Freycinet, the Minister of Public Works, said in speaking of his railway programme:—"We commence by drawing up a programme. We set down, so to speak, our railways, canals, rivers, and ports, and we say to France, 'To put all this in proper condition we think we should have to spend four or five milliards. We estimate that you could do so in ten years at 400,000,000f. or 500,000,000f. a year. Do you wish this to be done?' But we add, "Do not pledge yourselves yet for so long a period; you do not know what may happen? Only pledge yourselves for one-tenth or a year. Next year, if the circumstances are favourable, you will pledge yourselves for another tenth.' Believe me, France is not frightened."

M. Léon Say then, speaking on the same subject, said:—

"We ask to employ in public works, railways, canals, and ports, national savings to an amount just equal to what has been spent in France on such works for twenty years. We find that France can not only furnish the money needed, but that she can furnish more. In asking three, four, or five hundred millions for private works, we leave plenty of capital for a private initiative to vivify commerce, agriculture, and industry. In the most difficult moments of our contemporary history, never have the national savings halted. Even at the present moment, amid the intense crisis which industry is undergoing, the savings of the country do not cease. We have the proofs at hand. The deposits in the savings-banks, which have increased about 100,000,000 francs a year for some years, have already given us for the first seven months of this year 96,000,000 francs. There is, therefore, no falling off here; there is, on the contrary, an increase. I can show you how easy it is for the State to obtain sums almost as large as those we have spoken of without its being felt. We may say we do not ask of the national savings more than they can give; and as to whether the public works, which will certainly be very productive, will weigh too heavily on the budget, we may say that the taxes will be more easily paid if France is richer."

"PROPORTION."

SIR,—Our "geometrical" and good friend Mr. W. P. Griffith has not informed us where *his* system has proved of practical utility. But, after all, if that system be, as he professes, the Grecian, why, it is not his, and he is as much open to the charge of plagiarism as Mr. Hay. But I believe Mr. Griffith's system to be quite original, for I am pretty sure that the mathematical Greeks would not have dubbed the circle, the triangle, and the pentagon, *primary* figures, save and except in some very limited and guarded sense, the fact being that to all versed in geometry, the triangle and the circle represent the opposite poles of a series of figures varying from the least, 3, to an infinite number of sides. According to this one might call the triangle the primary, and the circle the ultimate figure; they were thus termed by Spenser. "These the first and last proportions are." The square, the pentagon, the hexagon, &c., are therefore all intermediate figures in this series. This title of *primary*, in Mr. Griffith's sense, is quite fanciful, and belongs to an antiquated and exploded system.

When published, my system may be as useless and as original as his, but he should neither attempt to unfairly judge by fragments nor to be prophetic. W. C. T.

ST. SEPULCHRE'S CHURCH, HOLBORN.

SIR,—This fine old parish church, which, together with most of the City churches, suffered greatly at the time of the Great Fire of London, had its interior afterwards entirely remodelled in the then prevailing style of the day. The old oak close-framed "pews" and flooring now just removed (being about 2 ft. above the original level) were put up years after, and the greater portion of the latter was found to be in a bad state of decay.

The Vestry, being anxious to restore the interior under my direction, have removed the same, and in so doing it has revealed the fact of there being several "skulls" and portions of bones of human beings beneath the said floor and joists, but certainly not "two cart-loads," as your correspondent states. The whole when found were deposited within the large vault alluded to, situate near the south-east corner of the south aisle, where a number of leaden coffins had been placed (I am told) some thirty years ago, means having then been taken to disinfect the same with large quantities of charcoal, &c., now to be seen covering over the whole surface.

The vicar and churchwardens, previously to any works being commenced, obtained a faculty from the Bishop of London, setting forth amongst other matters that, in the event of any human remains being found or disturbed, they should be reverently and decently interred, which has been done, as before stated.

The contract also provides that the whole inside area of the church should be covered over with cement concrete 6 in. in thickness, believing, as is almost invariably found to be the case in the restoration of an ancient parish church, some remains, human or other, would be found near or upon the surface, and this church proves to be no exception to the general rule.

I trust that this explanation of what your correspondent writes,—a "discovery has been made worthy of note,"—will exonerate, at any rate, the vicar and churchwardens, as well as myself and the builders, from any imputation of want of decency or regard to the feelings of any parishioner or others interested in the work of restoration.*

The so-called "vestry clerk's office and record-room" are neither of them more than of a temporary character, being formed in lath and plaster at the west end of the north and south aisles, and will be removed to complete the groining throughout the aisles.

The porch forming the south-west entrance to the church, with vestry clerk's offices above, will not be disturbed.

ARTHUR BILLING.

* There was no such imputation in our notice.—ED.

VENTILATOR TESTING.

SIR,—It is to be hoped some practical result may accrue from the discussion on this question. The letters from Mr. Buchan and Mr. Banner (pp. 998 and 999) give ground for such hope. Mr. Banner's suggestion of a 100-guinea fee is bold, and would keep out of competition others than those who have no less confidence in their ventilator than Mr. Banner has in his. Mr. Buchan's amendment is more to the purpose. We shall gladly avail ourselves of the opportunity, if offered, on anything like such terms, and so we should think would all who believe in their own speciality, unless they have already as much trade as they care for. At the same time, we cannot agree with Mr. Buchan that trial of a ventilator within "four walls of a shop" (which is hardly a correct rendering of our suggestion) is delusive. Trials of very small models may be, but if a ventilator of the size *proposed to be used* does, upon revolving or being fanned, actually produce a strong up-current in a room, it will do so, in spite of "counteracting force," at the top of a building. In the latter position it has only to assist or increase, while in the former it has to create the up-draught. A very slight breeze only is needed to turn a well-made revolving head, and experiment will prove that *a very slow revolution even* produces a positive up-current. Whether any down-draught can occur must depend very much upon the construction of the cowl. That Mr. Buchan has seen an up-draught when the archimedian ventilator was still simply proves that there may be a draught up a pipe without any top to it.

The question is,—Does the archimedian increase the draught when it turns ever so little? for, if so, there can be no doubt of its usefulness, and of its superiority to any fixed head.

EWART & SON.

SLATES.

SIR,—I note in your paper that one of your correspondents is horrified at the idea of re-roofing St. Alban's with slate. There are "slates and slates," and there is a deep rich brown slate which has a more mellowed and warmer look than the Westmoreland. It is little known, and comes from Swaledale, a district above Richmond, in Yorkshire. I have lately used it on a building for the Rev. S. Surtees, of Dinsdale-on-Tees, and the effect is all that could be wished. I should be glad to call the attention of the committee of St. Alban's to this roofing; it would avoid what your correspondent calls a "length of cold, cheerless slate."

J. R. NAYLOR, Architect.

THEATRICAL ARCHITECTURE.

"PIE-CRUST."

SIR,—I have had my attention directed to your able article on the above subject, p. 795, with which I most cordially agree, save in one particular. The "raised pie-crust" so justly condemned is not, and never has been, made of papier mâché. This material is uninflammable, and has excellent acoustic properties. The substance to which reference is made is known as carton-pierre, and contains a large percentage of plaster.

WALTER F. CLARE.

CONCRETE HOUSES.

SIR,—Had "J. S. S." taken yet "Another View" through the medium of concrete buildings many years extant, and thoroughly tested for resistance to dampness, instead of viewing the proposed concrete houses in Sutherlandshire through the brick walls of a shooting-lodge which did not keep out dampness, he would not have been misled by "feeling convinced" merely, but would have been convinced by knowledge of facts that concrete walls are the only ones to be relied on, and may be safely relied on, to resist the most humid climates, even where the best bricks fail.

Properly-built concrete walls do not require to be tiled or slated on the outside, nor battened on the inside, to insure perfect dryness.

I have resided in a house, built over five years ago, where the bottom of the water-cisterns is of concrete, 4 in. thick; the under side of the same 4 inches of concrete, forming the ceiling of the apartment under. The cisterns have been constantly full of water, but never so much as a stain of dampness has appeared through the 4 in. of concrete.

I know it is possible to build concrete walls that will not resist damp, just as it is possible to do inferior work of any kind, and I have seen such walls in concrete; but so sure am I of the certainty of successfully resisting dampness by concrete walls that I am willing to undertake to lose the whole cost in the event of failure in any concrete wall that I undertake to build damp-proof.

C. D.

LIGHTNING CONDUCTORS.

SIR,—I quite concur with the views expressed in the paper read by Mr. Anderson at the Dublin Congress, and reported in your journal of the 14th inst., as to the neglect manifested by many persons,

Firstly, in the non-protection of their property by the erection of lightning conductors.

Secondly, in allowing such conductors to be untested for years, and consequently worse than useless.

The latter neglect, however, I have no doubt, arises in many cases from the difficulty of ascertaining to whom one should apply for the efficient testing of a lightning conductor by means of the galvanometer named.

In my own case, if you, or any of your numerous readers, will inform me to whom such an application can be made, in London, you will confer a favour upon

DULWICH.

LIGHT AND AIR CASE.

HUGMAN *v.* HAYWARD.

IN this case (tried in the Chancery Division of the High Court of Justice),

Mr. Bristowe, Q.C., applied for an injunction to restrain interference by the defendant with the access of light to the plaintiff's premises, formerly the Alexandra Music-hall and Salmon public-house, but more recently known as the "Beaconsfield Music-hall," in Union-street, Borough. The defendant's premises are on the other side of the street, which is only 35 ft. wide, and were formerly so much lower as to leave a large area of sky space visible from the plaintiff's basement, whereas they had now been so raised as to darken and greatly diminish the value of his premises.

Mr. Millar said the defendant's case was that no substantial damage was caused by what the defendant had done, and another reason for the Court not interfering was that the building was completed and the roof was on.

Mr. Bristowe believed it had been hurriedly run up since the plaintiff had given notice.

Mr. Millar said the height had not been increased, though the roof had been put on. Any slight darkening of the plaintiff's cellar was immaterial.

Mr. Bristowe urged that the plaintiff had a right to his property in the light, which was now the more necessary as the basement of the Beaconsfield Music-hall and "Salmon" public-house had been converted into a grill-room and restaurant.

The judge said he would be very unwilling to make an order on the defendant to pull down, as he must if the case were gone into and injury were shown. The case had better stand over to the hearing, on terms of no further obstruction being caused to the plaintiff's light, and the defendant might agree to pay for the gas used in the meantime in lighting the plaintiff's premises.

Mr. Millar submitted that such terms had never been imposed by the Court in any case.

Some conflicting "expert" evidence was read, and after discussion it was agreed that the case should stand over, the defendant to be answerable for any damage occasioned to the plaintiff's premises by his new building as ascertained by a referee to be appointed.

FIRE-RESISTING CEILING.

MESSRS. H. LEIGH & SONS have patented a simple mode of producing a fire-resisting ceiling. By substituting hoop-iron suitably prepared for ordinary wood lathes, and coating with good plaster, a ceiling can be made through which it is next to impossible for fire to penetrate. The action of fire on such a ceiling appears to be that the plaster is hardened and baked on the laths. A striking proof of this took place a little before midnight on Monday, the 16th inst. One of the cotton-mills of Messrs. Barlow & Jones, Bolton, was discovered to be on fire in the second floor. The flames spread with great rapidity to the third, but could not get into the fourth room, owing to the roof of No. 3 room having been plastered on these hoop-covered iron laths. The fire raged in the third floor more than an hour without penetrating the ceiling.

A New Synagogue.—Dr. Adler, Chief Rabbi of the United Jewish Congregations of the British Empire, has consecrated a new synagogue attached to the Hand-in-Hand Asylum, Well-street, Hackney. Since its establishment in 1840 the institution has carried on its charitable operations in Wellclose-square, Whitechapel, in maintaining, clothing, and providing an asylum for aged and decayed tradesmen, but the lease of this building expiring last year, the committee determined on removing to more commodious premises. A large sum has been expended in adapting the building acquired to the requirements of the institution.

CHURCH-BUILDING NEWS.

Bath.—The Episcopal Chapel of St. Mary Magdalen, Holloway, Bath, was re-opened on the 29th ult., after reseating and other changes in the interior, which have been carried out by the Municipal Charity Trustees. The present chapel, with its battlemented tower at the west end, is an enlargement of the structure which preceded it. Between the years 1489 and 1499 the original chapel was rebuilt by John Cantlow, Prior of Bath, and this building, after undergoing restoration in 1760, was enlarged and converted into the present structure in 1823, when many of the features of the old chapel were, to the regret of the antiquary, swept away. It was opened for divine service in the following year, was closed at the opening of Widcombe Church in 1833, but again reopened in 1837, and in 1855 it passed under the government of the Municipal Charity Trustees, under a scheme established by Act of Parliament. In the present renovation of the chapel, the principal structural alteration has been the removal of an unused gallery staircase from the tower, which has been opened out to the nave, the walls being cased, and a tracery window glazed with cathedral glass has been inserted in the tower. The work of reseating and renovation has been carried out from the plans of Mr. H. Spackman (architect to the Charity Trustees), by Messrs. Hayward & Wooster.

Chipping Norton.—Considerable progress has been made in the restoration (under the superintendence of Mr. Bruton, architect, Oxford) of this interesting church. The galleries, pews, and benches have been removed; the flooring, which had become in places so decayed as to be unsafe, has been all taken away, and a wooden pavement laid down on concrete; and the aisles and porch will be paved with encaustic tiles. Open oak benches are being placed over the nave and aisles, the mutilated columns have all been restored, all plaster and wash removed from the walls and stonework, and the old historical marks of the church brought to light. Amongst these are the remains of the ancient shrine at the north-east end of the nave, the place of the founder's tomb (as supposed) in the south aisle, and the opening of two entrances which led to successive rood-lofts by the chancel arch. The remains of the old western arch have been shown, the hexagonal porch has been restored within to its ancient condition, and the original entry to the parvise above it, by a staircase from the church, has been restored. The old stoves (which were quite worn out) have been removed, and a new method of heating the church (by Haden) is to be adopted.

Walsham-le-Willows.—The parish church of Walsham-le-Willows was reopened on the 17th inst., after restoration under the superintendence of Mr. E. Martineau, architect. The church is a large edifice in the Perpendicular style, consisting of nave, with clearstory, chancel, and north and south aisles. The chancel was the first portion of the church to undergo restoration, it being put into thorough repair by Mr. Martineau, the lay impropriator, at his own cost, not more than a year ago. The new roof on the chancel is an open-timbered roof of stained and varnished pine. The restoration has now been effected of the nave and aisles. The roof remains intact and in its old condition. In taking the plaster off the walls the workmen came upon other traces of the painters' skill in the spandrels of the chancel arch, which appear to be frescoed representations of angels or cherubim, and on the east wall of the south aisle, where some diaper and panelled work was discovered. Some ancient tiles found in the church are let into the floor at this spot. The benches, which have replaced uncomfortable and unsightly pews, are of English oak, many of them in the south aisle having the old carved bench-ends, which had been utilised in the construction of the pews, and in other dishonoured ways. The benches provide accommodation for 450 persons. Porrett's hot-air apparatus has been fitted up beneath the floor of the nave. The pulpit is a new one of Caen stone, supported on dwarf pillars of red Mansfield stone. It is placed at the south side of the chancel arch, and is the gift of Miss E. Wilkinson. The total cost of the restoration (not including the cost to Mr. Martineau of restoring the chancel) has been 1,640*l*. The contractors were Messrs. Cawley, (of Bardwell) and Adams (of Stanton), their contract being 1,040*l*. The carving for the reading-desk, &c., was done by Mr. Wesley Baker, of Walsham.

Wribbenhall.—The foundation-stone of a new church for Wribbenhall, near Kidderminster, was laid on the 14th inst. The old church, which had been originally built as a sort of chapel-of-ease, has been long utterly inadequate for the wants of the parish. The architect is Mr. A. W. Blomfield, of London, and a contract has been entered into with Mr. Horsman, contractor, of Wolverhampton, to build a church for 6,000*l.*, to accommodate 400 people. According to the present contract the builder will have to go no higher than the string-cross of the base of the octagon of the tower, but it is hoped sufficient funds will be raised by that time to complete the church in accordance with the design, which is Early English in character. Mrs. Hemming, of Spring-grove, gives the munificent sum of 3,000*l.* towards the work.

Upper Bullinghope. — The corner-stone of a new church for the three parishes of Upper Bullinghope, Lower Bullinghope, and Grafton, has been laid by Mrs. de Winton. The builders, Messrs. W. Wingate & Son, Gloucester, presented Mrs. de Winton with a silver trowel. The present ancient church of Upper Bullinghope is stated to be in a most dilapidated and even dangerous state, and it has been found absolutely necessary that a new church should be built for the use of the three parishes, which are included in one. The estimated cost of the new church is 2,000*l.* The church will be built principally of native stone. Mr. Kempson, Hereford, is the architect.

Water Orton.—The foundation stone of Water Orton new church has been laid by Mrs. J. D. Wingfield Digby. Mr. J. D. Wingfield Digby gives the site and contributes 600*l.* towards the building. The church is to be dedicated to St. Peter and St. Paul, and is to be erected from the designs of Messrs. Bateman & Corser, architects, of Birmingham, the builder being Mr. Henry Motteram, of Tamworth. The edifice is expected to cost 3,000*l.* There will be accommodation provided for 250 worshippers, but the church is to be so constructed that it can easily be enlarged to seat 300 persons. The church will consist of a nave of three bays, north aisle, transept, organ-chamber, vestry, &c. The roof is to be open-timbered, and the exterior will be designed in Decorated Gothic of the Geometrical period. A tower will be erected at the north-west end of the aisle, terminating with a stone spire. Derbyshire stone will be used for the exterior of the building; but the dressings of the windows, doors, and interior will be of Bath stone.

DRY WALLS.

UPON reading the complaint of "J. S. S." on this subject at p. 998 of the *Builder*, I was reminded of a passage I had read years ago in, I think, Hugh Miller's "My Schools and Schoolmasters," which says that "the humidity of the climate" had no effect upon the walls built by a certain old mason, which were always dry, whereas the walls built by the other masons got damp in wet weather. The explanation of this was that the old mason chipped off the top edges of his stones so as to cause the water to run off outside; the others were not so particular, but put in the stones as they came to hand, at times with high edges at the top front, which caught and conducted the rain into the interior of the wall.

W. P. BUCHAN.

Fall of a Wall in Kentish Town.—On the 23rd inst. Dr. Hardwicke resumed and concluded an inquest as to the death of a little boy named Carwarden, five years of age, who was killed by the fall of a wall,—caused by a loaded timber van being driven against it by a carman named Bidnall, three other children being severely injured. The father asserted his belief that blame attached to the carman whose car knocked down the wall, and to the owner of the wall, as the wall was in an unsafe condition before the sad occurrence took place. Evidence was given that the wall before this accident was 2 in. or 3 in. out of the perpendicular, and dangerous to the public. Mr. Kelly (the owner of the wall) and Mr. H. H. Bridgman, architect, and gave evidence at considerable length, the jury, after consultation, expressed their opinion that the death was from accidental causes, but that there had been great neglect on Mr. Kelly's part in allowing a dangerous wall to exist for so long a time.

SCHOOL BOARD SCHOOLS.

Great Usworth (*Durham*).—The new schools erected at Great Usworth, by the Great and Little Usworth School Board, were opened on September 5th. The buildings, which are designed in a domestic type of Gothic, and built of stone, comprise mixed and infants' school-rooms, with class-rooms, hat and cloak rooms, and lavatories, together with a detached residence for the master and a large room for the meetings of the School Board. The site is one acre and a half in extent, and affords ample playgrounds, playsheds, &c., for the children, and garden-ground for the master. Although nominally for 350 children, the accommodation, calculated on the 8 ft. basis, is sufficient for 475. A well has been sunk on the site, and an abundant supply of excellent water obtained, which, by means of a force-pump, is distributed to the several parts of the establishment where required. The architects were Messrs. Sept. Oswald & Son, of Newcastle-on-Tyne, and Mr. G. E. Forster, of Washington, was the contractor. The seats and desks have been supplied by the North of England School Furnishing Company, Darlington.

Hornsey.—New schools erected by the School Board for Hornsey, in the Wordsworth-road, South Hornsey, have been opened. The schools are planned on the class-room system for the boys' and girls' departments, and, with the infants' schools, give accommodation for 1,200 children,—480 infants, 360 boys, and 360 girls. The central hall, which is 69 ft. long by 36 ft. 6 in. wide, with a height of 31 ft. 6 in., is designed as an examination-hall for the whole of the schools under the control of the Hornsey School Board, and will be used for assembling the children for lectures, drill, or collective singing. The long lantern roof is of wrought iron in arched ribs, and is lighted by vertical and sky lights. The class-rooms are grouped round the central hall, both on the ground and first floors, each room accommodating sixty children. The boys' and girls' departments are approached on distinct sides. The building is Gothic in style, the dressings to the street-front being of Bath stone. The building has cost upwards of 15,000*l.* Mr. T. Chatfeild Clarke is the architect.

Cannock.—On September 2nd the Cannock School Board opened their new schools in Walsall-road, Cannock. The schools will accommodate 220 boys and 220 girls; residences for the master and mistress are attached. About four months ago the Board opened a mixed school at Rawnsley, which provides accommodation for 200 boys, girls, and infants, with master's house attached. Both blocks of schools have been built by Messrs. H. & R. Inskip, of Longton, Staffordshire, at contracts of 4,964*l.* and 2,675*l.* respectively. Messrs. Scrivener & Sons, of Hanley, are the architects, and Mr. J. Siddalls is the clerk of works of both erections.

High Felling (*Durham*).—New schools which have been in course of erection by the Heworth School Board during the last twelve months at High Felling, from the designs of Mr. Thomas Oliver, were opened on the 19th ult. without ceremony, for the admission of scholars. The schools are arranged upon the mixed principle to accommodate 750 children, the boys and girls being taught in one department, and separate provision being made for the infants. The mixed school accommodates 500 children, and consists of one large room, with four class-rooms, so arranged that whilst the head-master has complete supervision of the main school and class-room, the children in the latter can be dismissed without passing through and disturbing the scholars in the former. The infants' school seats 250 children, and is composed of one large room and two class-rooms, grouped upon the same principle as the mixed school. The desks in the mixed school are placed five rows deep, and in the class-rooms three, and throughout the school the floors upon which the desks are placed are arranged as steps to facilitate teaching. Hat and cap rooms and lavatories, together with teachers' private rooms, are provided for each department. Covered sheds and latrines and separate playgrounds are also provided in connexion with the above departments, and in each case a large portion of the playground is cemented. A caretaker's house, of four rooms, is provided upon a portion of the site set apart for the purpose. The whole of the buildings are executed in brick, with stone dressings, and slated roof. A bell-turret is placed over the main schoolroom roof. The buildings have been carried out at a cost of about 7,300*l.*, by Messrs. White & Sproat, contractors, of Blyth. Messrs. Walker & Emley were the contractors for the hot-water apparatus and ventilation; and Mr. Lowes has acted as clerk of the works.

Smethwick.—The Smethwick and Harborne School Board has commenced the erection of new schools on a piece of land forming the corner of Ballott-street and Corbett-street, near the Windmill, Smethwick. The building, when complete, will accommodate 722 children, and will have large class-rooms for boys, girls, infants, and babies respectively. It will be ventilated with a series of ventilation shafts, which will be carried into, and have their outlet through, the tower, proposed to be built on the eastern corner of the structure, and Haden's system of heating will be adopted. A suitable teachers' residence will form a separate block building. The contract has been let to Mr. Hartley, of Birmingham, who will carry out the works, under the superintendence of Messrs. T. C. & J. P. Sharp, of Cherry-street, Birmingham, the architects to the Board.

Sowood.—The first sod of the excavations for the foundations of a new school at Sowood, for the Stainland School Board, has been cut. The school is intended to provide accommodation for 174 boys and 100 infants. The front of the building will face the turnpike-road leading from Stainland to Outlane. The roof of the building is pointed, and the front elevation shows two gables, one at each end, having a pointed traceried window in the centre of each gable, the entrance for the girls and infants being near the centre, over which is a belfry and turret. Adjoining the school, at the east end, is the master's house. The following are the contracts:—Mason's work, Mr. B. Edwards, Stainland, 1,250*l.*; joiner's, Mr. James Holroyd, Stainland, 375*l.* 16s.; plumber and glazier's, Mr. Joseph Aspinall, Elland, 102; plasterer and slater's, Mr. S. Collins, Stainland, 293*l.* 15s.; heating apparatus, Mr. R. P. Stafford, Halifax, 50*l.*; painter's, Mr. B. Brook, Lindley, 16*l.* 15s.; ironfounder's, Mr. James Dyson, 7*l.*; and land, 370*l.* Mr. C. F. L. Horsfall, Halifax, is the architect.

Felsted.—Plans for new schools about to be erected by the Felsted and Rayne (united districts) School Board have been prepared by Mr. Pertwee, architect, Chelmsford, and approved by the Education Department. Messrs. Parmenter & Gosset have obtained the contract.

Greasley.—New schools, erected by the Greasley School Board, were opened at Hill-top on the 16th inst. They have been erected, at a cost of between 5,000*l.* and 6,000*l.*, from the designs of Mr. Sutton, architect to the Board. The site of the schools and playgrounds is an acre in extent, and being at the junction of two roads, the buildings have been erected so as to take a double frontage, the boys' school extending along one road, the girls' along the other, while the infants' department projects into the angle between the other two, towards the rear. The schools will accommodate 550 children, 200 boys, 200 girls, and 150 infants, allowing 10 feet of space for each child. There is a dado of white enamelled bricks around the whole of the interior, with an ornamental border. The builders were Messrs. Coxon & Donnelly.

Bagillt.—New schools erected at Bagillt by the Holywell School Board, have been opened. The buildings, which have cost 6,000*l.*, are planned to accommodate 500 children—145 boys, 145 girls, and 210 infants. The architect was Mr. John Hill (Hill, Grylls, & Wilcocks, London), and the contractors, Messrs. Thomas Hughes & Son, Holywell.

Stratton St. Margaret.—New schools at Gorse-hill, erected by the Stratton St. Margaret School Board, have been opened. The schools are situate on the right-hand side of the main road leading from Swindon to Blunsdon, at the end of a street known as Avening-street, on a plot of land one acre and a half in extent purchased by the Board. The schools are a one-story building, and are fitted up for the accommodation of 450 children—boys, girls, and infants. The lavatories and other offices have all been fitted up by Messrs. Macfarlane & Co., of Glasgow. Whitwell's patent grates are used in all the rooms. On the left hand side of the yards, opposite the boys' school, the master's house is erected. The whole of the works were designed by Messrs. W. H. Read and W. Drew, joint architects to the Board, and have been carried out by Mr. Wiltshire, builder, of Swindon. The build-

ing contract was 4,150*l.*, and other expenses for land, &c., about 630*l.*, or nearly 10*l.* 10s. per head of accommodation provided.

SCHOOL BUILDING NEWS.

Scarborough.—The corner and memorial stones of a new Wesleyan Sunday School and lecture-hall, in connexion with Queen-street Wesleyan chapel, have been laid. The new building will be situate at the north end of the chapel, with which it will harmonise, being of red brick, with stone dressings. On the ground-floor will be provided five class-rooms, average size 15 ft. by 14 ft., and an infants' school-room, 37 ft. by 19 ft., all opening on to the central entrance. The large room will afford sitting accommodation for over 600 adults. The contractors are :—For brick, stone, slating, and plastering work, Francis Bastiman; for wood work, Thomas Fletcher; for plumbing and iron work, Whittaker Brothers; and for painting, Francis Thompson, all of Scarborough. The contracts amount to about 1,800*l.* The work is being executed from the designs and under the supervision of Mr. William Watson, architect, Wakefield.

Woodborough.—The new schools of "Wood's Foundation," at Woodborough, have been completed and opened. The schools are situated on the road leading from Woodborough village to Lambley, and the block comprises a large schoolroom in the centre, flanked on one side by a house for the master of the school, and on the other by a spacious class-room, behind which is an infant school, the rear being occupied by playgrounds and the necessary outhouses. Exteriorly, the new buildings may be described as in the Tudor style. The windows are open-sashed, and the schools are ventilated on Tobin's system. Accommodation is provided for 150 children; the large school-room being 40 ft. by 20 ft. Mr. W. B. Saunders is the architect, and Messrs. Tyres, jun., and W. D. Smith, the builders.

Winchester.—Mr. Thos. Stopher, architect, has prepared plans for the intended new "Winchester Modern School." The style selected is "English Domestic," and, including a master's house, the buildings have a frontage to the south nearly 250 ft. long, broken by two gables, and a rectangular embattled tower over the principal school entrance, the rest of the elevation showing two stories in height, with a provision for future dormitories if required. The external walls are to be of faced and squared flint, with red brick quoins and dressings of that material and of stone. Two bay windows,—one over the other,—lighting assistant masters' rooms, project from the tower face, and on each side in the two stories of the main portion of the building are three double-mullioned windows with segmental heads, and the windows in the gables are of the same character. The internal arrangements include on the ground floor six class-rooms 20 ft. by 16 ft. 6 in., a dining-room, apparently admirably lighted from the east and west, 51 ft. by 24 ft. and 16 ft. high. This is also, for the present, to be the schoolroom.

Bamborough.—A new school building which has been erected by the trustees of Lord Crewe's Charity in the village of Bamborough, has been opened. It will accommodate 150 children. The architect was Mr. John Henry, Durham; Mr. Carse, Amble, was the builder; Mr. Adam Gordon, North Sunderland, did the joiner work; and Mr. William Ramsay, North Sunderland, the painting.

Pontclown.—The foundation-stone of new schools has been laid here. Mr. R. Williams, of Llantrisant, is the contractor, and the cost of the building is to be 500*l.*, exclusive of fittings. Mr. Burnett is clerk of the works.

Ellesmere.—An influential meeting has been held at Market Drayton in support of the Church of England Public Boarding School about to be built at Ellesmere. It was stated that the school is to be begun forthwith; that the roads to the site are completed; that the cost of the building will be limited to 50,000*l.*; and that it will be built for 500 boarders.

Tatenhill.—A new school for this parish, erected by voluntary subscription, was formally opened on the 13th inst. The building was erected by Messrs. Lowe & Sons, Burton-on-Trent.

Llansaintffraid.—A new national school has been opened here. The land was given out of the glebe by the vicar, and the landowners, resident and non-resident, contributed liberally The farmers carried materials to the site with great willingness. Mr. Hurst, of Welshpool, was the architect; and Mr. Pickstock, of Hereford, the contractor.

Inverness.—The foundation-stone of a new "high school" for Inverness has been laid. The school is situated on the lands of Abertarf, Kingsmill-road. It is designed by Mr. Rhind, architect, and will cost about 6,000*l.*

STAINED GLASS.

Northampton.—The west window of St. Sepulchre's Church, Northampton, is to be filled with stained glass, the gift of Mr. William Colledge, churchwarden, and his brother, Mr. H. Colledge, as a memorial of their late father. Mr. Hardman is to be commissioned with the work.

Leominster.—In the year 1863 it was proposed to effect a thorough restoration of the venerable priory church of St. Peter and St. Paul, Leominster, and for this purpose a committee was formed to consult the late Sir Gilbert Scott, R.A., upon the subject. After a thorough survey, he estimated the cost at upwards of 15,000*l.*, and in May, 1864, the work was commenced, with the Norman nave and aisle, and north end of the church. A second committee has recently been formed, with a view to the restoration of the south side of this fine old pile, and also to fill with stained glass the noble central window of the west side; the latter being a memorial to a member of the Arkwright family. This window is in the Perpendicular style, and consists of seven lights, with tracery work, measuring altogether about 40 ft. high. Last year Messrs. Mayer & Co., of Munich and London, were selected to prepare a design, representing in the centre, compartments scenes from the life of St. Peter and St. Paul, the patrons of the Church, and in the outer divisions the twelve Apostles. As, however, the expense of painting the whole of this window was beyond the present means of the committee, the centre portion only has been so far executed, and was lately erected, the whole of the stone-work having been completely restored by Mr. Edwards, of Leominster.

Wellow.—A painted window is about to be placed in the chancel of Wellow Church, in memory of the late Mr. W. S. Ward, of Wellow Hall. The window is to be executed by Mr. C. E. Kempe, London.

Rock Ferry.—At St. Anne's (R.C.) Church, Rock Ferry, on the 15th inst., a new stained-glass window, which has been erected over the altar by Messrs. Rowland & Co., of Liverpool, was unveiled. The window is circular. The figure of St. Anne is the centre-piece, and among the scenes depicted are the Last Supper, the Resurrection, the Ascension, St. John Baptising Our Saviour, and also a figure of the Virgin. The cost was 160*l.*

Antwerp.—The King and Queen of the Belgians have lately presented to the cathedral at Antwerp a stained-glass window, designed by M. Van der Ouderau, and executed in Antwerp by MM. Auguste Stalins and Alphonse Janssens. In the centre of the window is represented the Virgin, patroness of Antwerp, with St. Joseph, patron saint of Belgium, surrounded by angels; beneath, the various Belgian provinces are represented by their patron saints in the attitude of prayer. The upper part of the window is occupied with the Royal arms, ciphers, and devices of their Majesties and of the kingdom of Belgium, and round the edge of the window are the various quarterings of the King and Queen.

VARIORUM.

"THE Arts of Writing, Reading, and Speaking: Letters to a Law Student," by Edward W. Cox, Serjeant-at-law (10, Wellington-street), has obtained the circulation it well deserved, and we find on our table a copy of the third edition, revised and corrected. It is easier, as *Portia* says, to tell twenty people what they should do than to be one of the twenty to follow the teaching; still, no one who wishes to excel in the arts of reading, writing, and speaking can possibly study Serjeant Cox's little volume, with a desire to learn, without great and lasting benefit. It is a most valuable work, and, so far from being confined to law students, ought to be made a school-book throughout the country.——"Nelson" is the title of "a play in four acts, and a tableau," by Emilia Aylmer Blake, now Mrs. Aylmer-Gowing, published by Chapman & Hall. Mrs. Gowing is the author of several acted plays, and shows in "Nelson" a full knowledge of the exigencies of the stage. The play written mainly in blank verse, avoids the "stilts," and if set forth by able exponents, could scarcely fail to be successful in the theatre. It deals mainly with the time when Nelson was in and off Naples, and ends with a tableau from West's picture of his death.——Messrs. Cassell, at all events, usually obtain the best available men for the works they publish. Their "New Testament Commentary for English Readers" is edited by Dr. Ellicott, Bishop of Gloucester and Bristol, and the first volume now published contains the Gospel according to St. Matthew, St. Mark, and St. Luke, by the Rev. Dr. Plumptre, and the Gospel according to St. John, by the Rev. H. W. Watkins, M.A., Professor of Logic and Moral Philosophy in King's College, London. It makes a handsome volume, and will doubtless be appreciated by the large class of thoughtful men and women to whom it is addressed.

Miscellanea.

Commutation of Tithes.—The Act just passed to amend and further to extend the Acts for the Commutation of Tithes in England and Wales has been issued. In all cases where land charged with rent-charge in lieu of tithes is taken for the building of a church, chapel, or other place of public worship, the making of a cemetery, the erection of a school under the Elementary Education Act, the erection of a town-hall, court of assize, lunatic asylum, hospital, or any other building used for public purposes, or in carrying out any improvements under the Artisans' Dwellings Act, 1875, the formation of any sewage-farm under the provisions of the Sanitary Acts, or the construction of any sewers or sewage works, or any gas or water works, the persons to carry out such works are, so soon as they are in possession of the land, and before the land is applied to any of the purposes mentioned, to apply to the Tithe Commissioners to order the redemption of the rent-charge for a sum of money equal to twenty-five times the amount thereof, to be paid within the time to be fixed by the Commissioners. The existing powers in the recited Acts from the 7th Will. IV. are to apply to the present statute; and with reference to the exchange of the glebe lands for other lands, the provisions are to be deemed to authorise any spiritual person (clergyman) to exchange for lands or for tithe rent-charge any annual payment or augmentations belonging to him in right of his benefice, and charged upon or payable out of any land or tithe rent-charge.

Study of Archæology.—Mr. Percy Gardner writes:—I am glad to see that the claims of classical archæology upon English scholars have found so able an advocate as Professor Jebb, a name likely to carry weight at the Universities. Mr. Jebb proposes as a remedy for the indifference to and ignorance of archæology which characterise England as compared with Continental nations, the establishment of schools at Athens and Rome like those already established there by France and Germany. But it would be useless to set men to study archæology unless that study is to lead to something. In Germany every University has its Professor of Classical Archæology; in France the Academy opens its doors freely to men who distinguish themselves in the study. In England, what is there to be had by the study of archæology? The Cambridge professorship is, I believe, worth 100*l.* a year. I do not know of any other professorship in the subject in the United Kingdom. The examinations at both Oxford and Cambridge are philological and philosophical, and a knowledge of ancient life and art goes for nothing. Yet a very successful Cambridge tutor told me that his one greatest difficulty was to persuade his men of the reality of ancient life, that the Greeks and Romans were men and women, not puppets or counters. And this is just the feeling which can be produced only by travelling in the scenes of ancient history, or studying the art remains of antiquity.

The "Stanley" Sash Opener and Fastener has received "Honourable Mention" at the Paris Exhibition, 1878, class 66. We have already spoken well of this invention. Practical experience of it for several months since would lead us to strengthen the testimony we gave in its favour.

Westminster as it Will Be. — "The *Builder* contains a plan showing the Westminster of the future. It certainly presents many interesting features, and its general characteristics are justified both by the importance of the position and the several improvements which are either now in course of being carried out or projected. One of the most important alterations will be the setting back of the entire block of houses on the western side of Parliament-street, making the roadway run on in a line with the present Foreign Office. This will be partly caused by the taking by the Government of the entire block of buildings between Parliament-street and the park. King-street will thus be abolished, but Delahay-street, slightly altered, is proposed to be retained; and a very ancient house, said to once belong to Judge Jefferies, is not to come down. The new Great George-street will become the home of Government offices, and palatial buildings form a fitting approach to Westminster Palace from St. James's Park. Regret is expressed that the Aquarium must remain, as the architectural belongings of the building are not in accordance with that of the Abbey and Palace. Queen Anne's Mansions find no favour with the writer, and a broad street is proposed where now Tothill-street exists. The hospital it is proposed to retain, and the Stationery Office, but the old Guildhall is to go, forming on its site a grand *place* or square, and, to complete the picture, the towers of the Abbey are to be altered and partly rebuilt. Then the New Law Courts will cause the existing dens next to Westminster Hall to be removed, and thus considerable space will be obtained in this locality. South of the Parliament Houses it is proposed to put a *campo santo*, and, taking down the houses on the opposite side of Abingdon-street, the street is widened. The remaining portion of the altered district is now composed of wharf-factories and buildings of a very poor and neglected character, and it is boldly proposed to clear the entire space and create another but handsomer Eaton-square, with some other alterations towards the Pimlico end. The entire area from the park to the river is laid out in a very admirable manner. We have no doubt, could the scheme become a fact, that it would not only be a considerable improvement both as far as health and convenience are concerned, but it would be eminently a paying speculation, and worthy the attention of those building capitalists who in many cases sink fabulous sums quite away from centres of population."—*Metropolitan.*

Alleged Failure of Concrete Drain-pipes.—At the last meeting of the Bournemouth Commissioners, the Sanitary Committee presented two reports stating, in effect, that many of the concrete pipes being used by the contractor, Mr. Stickland, in the new drainage works, were broken, or had become broken since being laid, and recommending that no more of them be used. It was also alleged, in the course of the discussion which followed the reading of the reports, that many of the pipes are so porous that they will allow of the intermixture, by percolation, of the sewage and subsoil water. In answer to these charges, a letter was read from the manufacturers of the pipes, Messrs. Sharp, Jones, & Co., maintaining that the pipes are not defective, either as to material or manufacture, and that the sewer "has failed under conditions that would tend to destroy any ordinary sewer, brick or pipe." Messrs. Sharp remind the Commissioners that when it was first proposed to use the pipes, an expert of the Commissioners' own choosing (Mr. Henry Reid) was called in, and reported very favourably as to the capabilities of the pipes. In conclusion, they say, "We have engaged two engineers of well-known standing to make a thorough investigation on our behalf, and we must inform the Board that we shall resist to the utmost, and at all costs, any attempted impeachment of these pipes, and more especially so upon a false issue." The Commissioners, for their part, have also resolved to request "two qualified engineers" to report upon the matter.

St. Bride's, Fleet-street.—The outer vestibule, which has been completed within the last few days, has been laid down with marble, principally in black and white squares laid diagonally. In the centre of the vestibule is a star in a circle, formed of black, white, and dove marble, with a centre of Panderma (Turkish) marble. The repaving of the inner vestibule, in which the same material is used, has been commenced.

The Chapel on Rochester Bridge.—The demolition of the Bridge Chamber at Rochester Bridge has led to the opening up of the remains of the ancient chapel of Alle Solven, or All Souls, the existence of which was well known to antiquaries, although what remained of the ancient edifice was entirely hidden by the surrounding buildings, a portion of the chapel being, until very recently, a dwelling-house. The whole of the walls of the chapel, up to what once was the roof, are now visible, together with portions of the oak beams, while near where the altar formerly stood has been found a piscina. The main entrance through the porch, which still stands, is in a perfect state, while the stone mouldings of the door and windows, and portions of the pointed arches, may still be traced. The chapel of All Souls was founded by Sir John de Cobham (who, with Sir Robert Knolles, was the founder of the ancient bridge over the Medway at Rochester), and was built in 1399 in accordance with the then prevailing custom of building chapels near bridges, and was intended primarily for the use of travellers crossing the bridges. The restoration of the ancient chapel is spoken of.

Building Bye-Laws for Kingston-upon-Thames. — The Kingston Town Council has postponed for two months the adoption of the proposed new bye-laws, as submitted by the Joint General Purposes and Improvement Committees. Councillor Bussell said these bye-laws appeared to be the most extraordinary set that ever were framed. For instance, No. 30 ran thus,—"A person who shall erect a new building shall not place in any party wall of such building any bond timber, or any plate, block, brick, or plug of wood." How a man was to put up a party-wall without a brick he, for the life of him, could not understand. The Mayor said he had in committee raised the same objection, but it was not a brick in the ordinary sense of the word. What was meant was a "brick of wood." [Any builder would know that, but the clause would be likely to prove somewhat ambiguous to what is called "the legal mind."]

Discovery of Ancient Remains in the City.—During the demolition of houses which is taking place on the south side of the upper part of Ludgate-hill, for improvements designed by the Corporation of London, distinct remains have been discovered of a massive wall running in the direction of north-west-by-west. A daily contemporary says,—"A spacious area is being cleared at the back of Ludgate-square, and one block of the wall occupies several yards near Creed-lane. The materials are Kentish ragstone, flints, and chalk, the well-known courses of tiles forming layers at intervals." We failed to discover any wall displaying these bonding courses; we found, however, a length of rubble wall of considerable antiquity, without the bond-courses, and which the workmen have considerable difficulty in destroying.

The Awards at the Paris Exhibition.—The *Paris Exhibition of* 1878, an illustrated weekly review, gives in its number for September 19th (No. 27) a list of the prizes and medals awarded to English exhibitors, exclusive of the Art Section. It occupies twelve pages of the review, and must have cost much labour, as no official list has yet been published. It is rumoured, we hope untruly, that numerous awards to exhibitors have been made since the juries broke up.

City of London College, 52, Leadenhall-street.—The Michaelmas term will commence on the 7th of October. There are Technical, Drawing, Machine, and Building Construction classes, under Mr. Henry Adams. The syllabus of class-work reads well. Students in these classes are eligible for a number of prizes. A class in land-surveying will be commenced in November.

Fall of a Wall at Plymouth Theatre.—Great alarm was caused at Plymouth by the sudden fall of a large portion of the wall of the theatre, which is being rebuilt after destruction by fire. A mass, 40 ft. long by 30 ft. high, without any warning, fell bodily; but the workmen having just left work, no one was injured.

Buildings for Ipswich.—At a meeting of the Ipswich Town Council, it was decided to build a museum, school of art, and a free library, at a cost of 8,100*l.*, and also to erect a hospital for patients suffering from infectious disease, at an outlay of 3,600*l.*

Working Men's College.—A free library and reading-room will be opened on the 1st of October next at the Working Men's College, 143, Upper Kennington-lane. Professor Huxley will give a lecture early in October at a general meeting to be held as a formal opening of the new premises of the college.

The Conservative Land Society.— Mr. Charles Belton, who has been accountant to the Conservative Land Society for twenty-five years, and to the United Land Company ever since its formation, has been appointed secretary to both the Society and Company, in place of the late Mr. John Ashdown.

Birkbeck Literary and Scientific Institution, Southampton-buildings, Chancery-lane.—The fifty-sixth session of this, the parent Institution, commenced this week. One hundred classes meet weekly in various subjects. A new laboratory has been erected during the recess.

Carlisle.—The City and District Banking Company are about to erect new branch offices at Brampton and Haltwhistle, from the designs of Messrs. Hetherington & Oliver, architects, Carlisle.

A New Cathedral Church (R.C.) is to be built at Oban, N.B., from the designs of Messrs. Pugin, Ashlin, & Pugin, architects.

TENDERS

Accepted for alterations to Hindpool-road Congregational Church, Barrow-in-Furness. Mr. Howard Evans, architect:—

Rothwell (plumber, painter, &c.)	£120 0 0
Kelsall (excavator, bricklayer, and asphalter)	64 0 0
Eccles (smith and founder)	45 14 6
Ormandy (carpenter and joiner)	15 10 0
Bushby (mason)	5 14 9

For alterations to City Scotch Stores, Knightrider-street, E.C. Messrs. Pain & Clark, architects:—

Judd (accepted)	£255 17 0

For the erection of Infant School, East Oakley, Basingstoke, for the Wooton and Tadley School Board. Mr. James Gibson, architect. Quantities supplied:—

Mussellwhite	£494 0 0
Stephens & Bastow	485 0 0
Batton	475 0 0
Groome	419 0 0
Wyeth & Garrett	411 0 0
Goodall (accepted)	400 12 8

For the erection of stables at Herman-road, Old Kent-road, for the London Tramways Co. Mr. G. Wade, architect:—

Thompson	£837 0 0
Lang & Co.	667 0 0
Holliday, jun. (accepted)	657 0 0

For shop in Chatsworth-road, Clapton-park, for Mr. Harding. H. Shaw, architect:—

		Allowance for old materials.
Stamp & Bowtle	£1,087 0 0!	£65 0 0
Jones	1,063 0 0	95 0 0
Upson	926 0 0	25 0 0
Shurmur	949 0 0	67 0 0
Salmon	900 0 0	50 0 0
Wood	595 0 0!	60 0 0

For house, St. James-road, Upper Tooting, for Mr. J. Miston:—

Downs & Co. accepted.

For warehouses, Currier-street, Oxford-street, for Messrs. Deed & Son. Messrs. Searle, Son, & Hayes, architects:—

Downs & Co. accepted.

For erecting building, sinking well, &c., and forming bridge over creek, for Ammonia Works, Rainham, Essex, for Mr. M. Solomons. Contract No. 1. Messrs. Walter Graves & Hulbert, architects. Quantities by Messrs. Whitmore & Kennard:—

		Bridge.
Wood	£768 0 0	£70 0 0
Vears & Co.	755 0 0	59 0 0
Jefferson	675 0 0	48 12 6
Hunt (accepted)	594 0 0	48 0 0

For works at public baths, &c., Hastings and St. Leonards-on-Sea. Messrs. Cross, Jeffery, Skiller, & Wells, architects:—

Additional Ironwork.

Rother Ironwork Company	£2,529 14 0
Fraser Bros.	2,293 0 0
Tillotson	2,108 5 0
Moreland & Son	1,971 14 0
Bunnett & Co.	1,875 10 0
Alderton & Shrewsbury	1,863 18 0
Measures Bros.	1,636 0 0
Dawnay	1,627 0 0
Gielgud	1,527 7 0
Shaw & Co.	1,500 0 0
Homan & Rodgers (accepted)	1,496 0 0

Finishings to Skylights to Gentlemen's Baths.

Rodda	£372 0 0!
Hughes	190 10 0
Harman	187 10 0
Cruttenden	171 10 0
Parks	167 12 0
Eldridge	166 0 0
Vidler	158 0 0
Howell & Son (accepted)	152 0 0!

For alterations at Alexandra Tavern, Bow-street. Mr. W. Paice, architect:—

Bodein	£225	0	0
Hocking	168	0	0
Bangs	160	0	0

For alterations, additions, painting, &c., Freemasons' Tavern, Great Queen-street, Lincoln's-inn-fields, for Mr. Alfred Best. Mr. John Pugh, surveyor:—

MacIntosh (accepted)	£915	0	0

For patent ventilators, the estimate of Messrs. Verity Brothers has been accepted.

For foundations up to line of ground floor, Municipal Offices, Leeds. Mr. George Corson, architect:—

Thornton	£6,592	0	0!
Wade & Son	5,626	10	9½
Plows	5,380	0	0
Hall	4,840	0	0
Ives & Son	4,631	0	0
Brier, Son, & Wilson	4,450	0	0
Wilson & Sons	4,300	0	0
Franks & Evans	4,300	0	0
Garland	4,290	0	0
Whitaker Bros.	4,283	0	0
Hannan & Barber	4,256	0	0
Bentley & Burn	4,000	0	0
Boothman	3,987	15	0
Pickard	3,933	0	0
Nicholson & Son	3,893	0	0
Armitage & Hodgson	3,786	0	0
Irwin	3,696	11	11
Longley Bros.	3,660	14	3
Wood (accepted)	3,600	0	0!

For the erection of No. 148 and 148A, Oxford-street, or Mr. F. Marsh. Mr. Aug. E. Hughes, architect:—

Higgs & Hill	£8,940	0	0
Colls & Son	8,620	0	0
Simpson & Son	8,602	0	0
Grimwood	8,586	0	0
Rider	8,478	0	0
Williams & Son	8,320	0	0

For new stables, for the London General Omnibus Company, Lower Clapton. Mr. Tosh, architect:—

North	£2,839	0	0!
Berry & Evans	2,376	0	0
Anderton	2,300	0	0
Wells & Martin	2,295	0	0
Larkin & Son	2,192	0	0
Hammond	2,100	0	0
Newman & Mann	2,005	0	0
R. & E. Smith	2,000	0	0
Hobern	1,990	0	0
Aitchison & Walker	1,800	0	0
Saw	1,714	0	0
Lamper & May	1,700	0	0
Sherlin	1,683	0	0
Wyse	1,674	0	0
Crab	1,665	0	0
Parker & Crab	1,658	0	0
Perkins	1,621	0	0
Beal	1,618	0	0!

For additions and alterations to offices, 10 and 12, Cheapside, Hanley, Staffordshire, for Mr. E. Tennant. Mr. W. A. Keates, architect. Quantities supplied:—

Redfern	£453	9	4
Matthews	416	0	0
Ellis (accepted)	410	0	0

For new conveniences to the Bethesda Chapel Schools, Hanley, Staffordshire, for the Trustees. Mr. W. A. Keates, architect:—

Ellis	£143	0	0
Matthews	116	0	0
Brereton (accepted)	114	10	0

For alterations at premises, Broadway, Deptford, for Mr. T. Parry (exclusive of shop-front). Mr. Hunt, jun., surveyor:—

Thomas	£600	0	0
Garlick & Cain	590	0	0
Slade	573	0	0
Hubble & Trott	529	0	0
Rowe (too late)	525	0	0
Thomas (accepted)	499	18	6

For building a new wing to residence in St. Mary's, York, for Mr. R. Johnson:—

Jackson & Spencer (brick, stone, and joiner's work)	£299	0	0
Dodgson (slater)	34	18	0
Dickinson (plumber and glazier)	41	10	0
Waud (plasterer)	40	10	0
Huggons (tile pavements)	26	0	0
Thomas (painter)	10	13	0

For rebuilding the Fox Inn, Holgate, near York, for Mr. Francis Barlow:—

Barry	£1,060	0	0
Biscomb	1,005	0	0
Keswick & Son	934	0	0
Weatherley (accepted)	920	0	0
Harrison	875	0	0
Simpson	834	0	0

For additions to Acomb Hall, for Capt. Starkey:—

Keswick	£116	12	0
Harrison (accepted)	112	0	0

Accepted for new warehouse, North-street, York, for Mr. E. Sherwood:—

Simpson (bricklayer and plasterer)	£435	0	0
Harrison (carpenter and joiner)	375	10	0
Kilvington (mason)	53	0	0
Carlile (slater)	62	10	0
Shouksmith (plumber and glazier)	40	0	0
Arnitt (painter)	10	18	0

For additions to three farmsteads on Carlton Towers Estate, Selby, for Lord Beaumont:—

Jackson Bros.	£250	0	0
Shouksmith (iron spouting)	68	17	0

For the erection and completion of Christ Church Parsonage, Beckenham, Kent, for the Rev. J. Welsh. Mr. Charles Fitzroy Doll, architect. Quantities supplied:—

Temple & Forster	£2,240	0	0
Shearburn	2,017	0	0
Smith	1,965	0	0
Graham	1,897	0	0
Barber	1,890	0	0
Jarratt	1,780	0	0
Cooper	1,775	0	0
Taylor	1,773	0	0
Hooker	1,684	0	0

Three Houses at Poplar.—I notice in your last a tender from Judd & Hawkings for the erection of three houses and shops in Poplar. The partnership between Mr. Hawkings and myself having been dissolved, and I alone having tendered for the job, I should feel obliged if you will kindly make the correction in your next.—A. S. JUDD.

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